

Public Participation in a City Council Meeting:

The Public Comment portion of the meeting is the time to address the Mayor and City Council on topics not on the agenda. If a member of the public wishes to comment on an item on the agenda, they may do so while that item is being discussed by coming to the microphone and stating your name and address. Comments should be limited to 3 minutes or less and should be addressed to the Mayor and Council as a whole and not individually. Response from elected officials or staff is at the Mayor's discretion.

**CITY OF MARSHALLTOWN COUNCIL AGENDA
CITY HALL COUNCIL CHAMBERS
10 WEST STATE STREET
FEBRUARY 24 2024, 5:30 PM**

A. CALL TO ORDER

B. PLEDGE OF ALLEGIANCE

C. ROLL CALL

Fonseca, Kell, Ladehoff, Mitchell, Nichols, Schneider, Thompson

D. PUBLIC COMMENT

Members of the public may make comments on any item which was not on the agenda during this time. The speaker shall approach the microphone, and state his or her name and address. Comments shall be limited to three minutes unless a longer comment is authorized by the Mayor. The speaker shall direct comments to the Mayor and to the Council as a whole.

The Mayor and Councilors shall not engage in discussion or debate on items raised by members of the public, and no action may be taken on items raised in public comments in order to comply with open meeting laws.

E. COUNCIL, ADMINISTRATOR, AND MAYOR COMMENTS

1. YEARS OF SERVICE - FEBRUARY

- Nate McDowell - Streets - 5 years
- Brad Rozell - WPCP - 5 years

F. CONSENT AGENDA

**1. APPROVE MINUTES 02/10/25 MEETING AND BILL LIST
\$1,266,586.56**

Documents:

[2025-02-10_SIGNED Council Proceedings.pdf](#)
[2025-02-24_BILL LIST Summary.pdf](#)
[2025-02-24_BILL LIST Detail.pdf](#)

2. APPROVE ALCOHOL LICENSE RENEWALS

- GROCERY STORE & TORTILLERIA LA VECINDAD, 505 N 3RD AVE
- ELMWOOD COUNTRY CLUB WITH OUTDOOR SERVICE & OWNERSHIP UPDATES, 1734 COUNTRY CLUB LANE
- DOLLAR GENERAL #4206 WITH OWNERSHIP UPDATES, 2413 S CENTER ST
- DOLLAR GENERAL #2019 WITH OWNERSHIP UPDATES, 408 S 9TH ST
- CASEY'S #1303, 111 N 3RD AVE
- YESWAY #1148, 1701 IOWA AVE W
- FOOD & GAS MART, 613 N 3RD AVE

3. APPROVE CIVIL SERVICE PROMOTIONAL LIST - POLICE CAPTAIN

Documents:

[2025-02-24_CONSENT_Civil Service - Police Captain Promotional Hire List.pdf](#)

4. APPROVE FINANCIAL STATEMENTS - JANUARY 2025

Documents:

[Memo January 2025 Financial Statements.pdf](#)
[January 2025 Financial Statements.pdf](#)

5. RESOLUTION 2025-029 APPROVING APPLICATIONS FOR TAX ABATEMENT WITHIN APPROVED URBAN REVITALIZATION AREAS OF THE CITY OF MARSHALLTOWN, IOWA

Documents:

[2025-02-24_2025-029_Resolution Approving Tax Abatement Applications.pdf](#)
[2025-02-24_2025-029_Memo Tax Abatement Applications.pdf](#)
[2025-02-24 2025-029 Tax Abatement](#)

6. RESOLUTION 2025-030 APPROVING 28E AGREEMENT FOR MUTUAL ASSISTANCE FOR POLK COUNTY AREA FIRE/RESCUE SERVICES

Documents:

2025-02-24_2025-030_Resolution Approving 28E with Polk County for Fire Services.pdf
2025-02-24_2025-030_PCFCA 28E MEMO TO COUNCIL.pdf
2025-02-24_2025-030_PCFCA 28E Polk Co Area Fire_Rescue Services (12-2024) FINAL.docx.pdf
2025-02-24_2025-030_PCFCA 28E Polk Co Area Fire_Rescue Services (upd 9-2024) REDLINED.docx.pdf
2025-02-24_2025-030_PCFCA 28E Signature Page 2024.pdf

7. RESOLUTION 2025-031 ACCEPTING IOWA DOT OFFER OF CITY BRIDGE FUNDING FOR THE CENTER STREET BRIDGE OVER LINN CREEK PROJECT, #STR25001

Documents:

2025-02-24_2025-031_Resolution Accept City Bridge Funding Offer for Center St Linn Creek.pdf
2025-02-24_2025-031_Memo_Accept Funding Agreement for Center St Linn Creek Bridge_25 02 24.pdf
2025-02-24_2025-031_CityBridgeAgreement 1-25-HBP-U-005.pdf

8. RESOLUTION 2025-032 SETTING PUBLIC HEARING FOR PROPOSED PROPERTY TAX LEVY FOR FY26 BUDGET

Documents:

2025-02-24_2025-032_Resolution to Set Public Hearing for Property Tax Levy for FY26 Budget.pdf
2025-02-24_2025-032_Memo to set public hearing for proposed property tax levy.pdf
2025-02-24_2025-032_Notice of Public Hearing for Proposed Property Tax Levy.pdf

G. REPORTS

1. LEGISLATIVE UPDATE

H. RESOLUTIONS

1. PUBLIC HEARING AND RESOLUTION 2025-033 APPROVING THE LEASE AGREEMENT WITH THE

CENTRAL IOWA RIVER GUN CLUB OF MARSHALLTOWN, IOWA

Documents:

[2025-02-24_2025-033_Resolution Iowa River Gun Club Lease 10 years.pdf](#)
[2025-02-24_2025-033_Memo Lease Agreement Gun Club.pdf](#)
[2025-02-24_2025-033_Lease Agreement Central Iowa Gun Club.pdf](#)

2. PUBLIC HEARING AND RESOLUTION 2025-034 APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE EAST MAIN STREET & CENTER STREET RECONSTRUCTION PROJECT, IN THE CITY OF MARSHALLTOWN, IOWA, BEING PROJECT NO. STR22-002

Documents:

[2025-02-24_2025-034_Resolution Approve Plans, Specs Main St Reconstruction.pdf](#)
[2025-02-24_2025-034_STR22002_Memo_E Main-Center Recon PH and Approve Bid Docs 25 02 24.pdf](#)
[2025-02-24_2025-034_STR22002_E Main St and Center St_Notice-Bidders_25 02 06.pdf](#)
[2025-02-24_2025-034_STR22002_E Main St and Center St_Notice-Hearing_25 02 06.pdf](#)
[2025-02-24_2025-034_STR22002_E Main St and Center St_OPC-Alternates-IFB_25 02 06.pdf](#)
[2025-02-24_2025-034_STR22002_E Main St and Center St_OPC-Base-IFB_25 02 06.pdf](#)
[2025-02-24_2025-034_STR22002_E Main St and Center St_Plans-Alternates-IFB_25 02 06.pdf](#)
[2025-02-24_2025-034_STR22002_E Main St and Center St_Plans-Base-IFB_25 02 06.pdf](#)
[2025-02-24_2025-034_STR22002_E Main St and Center St_Project Manual-IFB_25 02 06.pdf](#)

3. PUBLIC HEARING AND RESOLUTION 2025-035 APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT, IN THE CITY OF MARSHALLTOWN, IOWA, BEING PROJECT NO. STR25- 002

Documents:

[2025-02-24_2025-035_Resolution Approve Plans, Specs Median Replacement.pdf](#)
[2025-02-24_2025-035_STR25002_Memo_Center St Median Approve Plans_25 02 24.pdf](#)
[2025-02-24_2025-035_STR25002_Center St](#)

[Median_Joint Notice_25 02 06.pdf](#)
[2025-02-24_2025-035_STR25002_Center St](#)
[Median_OPC_25 02 06.pdf](#)
[2025-02-24_2025-035_STR25002_Center St](#)
[Median_Plans_25 02 06.pdf](#)
[2025-02-24_2025-035_STR25002_Center St](#)
[Median_Project Manual_25 02 06.pdf](#)

**4. PUBLIC HEARING AND RESOLUTION 2025-036
APPROVING PLANS, SPECIFICATIONS, FORM OF
CONTRACT AND COST FOR THE WPCP SLUDGE
THICKENING PROJECT, IN THE CITY OF
MARSHALLTOWN, IOWA, BEING PROJECT NO.
WPC24001**

Documents:

[2025-02-24_2025-036_Resolution Approve Plans,
Specs WPCP Sludge Improvements.pdf](#)
[2025-02-24_2025-036_WPC24001_Memo_Sludge
Thickening Approve Plans.pdf](#)
[2025-02-24_2025-036_WPC24001_Sludge
Thickening_NoticeOfHearing_25 02 06.pdf](#)
[2025-02-24_2025-036_WPC24001_Sludge
Thickening_NoticeToBidders_25 02 06.pdf](#)
[2025-02-24_2025-036_WPC24001_Sludge
Thickening_OPC-IFB_25 02 05.pdf](#)
[2025-02-24_2025-036_WPC24001_Sludge
Thickening_Plans-IFB_25 02 05.pdf](#)
[2025-02-24_2025-036_WPC24001_Sludge
Thickening_Project Manual-IFB_25 02 06.pdf](#)

I. DISCUSSION

**1. DISCUSSION - MARSHALLTOWN PUBLIC LIBRARY
MOBILE OUTREACH VEHICLE (MOBI)**

Documents:

[2025-02-24_DISCUSSION_Memo MOBI Surplus
Request.pdf](#)

2. DISCUSSION - COMPOST FACILITY

Documents:

[2025-02-24_DISCUSSION_Memo_Compost Facility-
Hours and Days of Operation.pdf](#)
[2025-02-24_DISCUSSION_Budget Comparison
Report_Compost_250219 DRAFT.pdf](#)

3. DISCUSSION - GENERAL FUND OPTIONS

Documents:

J. CLOSED SESSION - PENDING LITIGATION

Closed session pursuant to Section 21.5, subsection 1, paragraph c, of the Code of Iowa, to discuss strategy with counsel in matters where litigation is imminent where its disclosure would be likely to prejudice or disadvantage the city in that litigation.

The City of Marshalltown has an attorney-client relationship with Lynch Dallas P.C., by Council Resolution 2022-161, approved 06/13/22. There may be council action by motion following the closed session if directed by the City Attorney.

K. ADJOURNMENT

MISSION STATEMENT

**The City of Marshalltown collaborates to provide
a welcoming, safe, vibrant, and growing
community.**

Please visit the City's website for the complete agenda packet and to subscribe to agenda notices and department news at www.marshalltown-ia.gov.



**MARSHALLTOWN
MORE THAN EVER**

**COUNCIL PROCEEDINGS
FEBRUARY 10, 2025**

Mayor Greer called the meeting to order at 5:30 pm, February 10, 2025, at the City Hall Council Chambers, 10 W State Street, and led the pledge of allegiance. Roll call–Present: Fonseca, Kell (via Go-To-Meeting), Ladehoff, Mitchell, Nichols, Schneider, Thompson. Public comments for items not on the agenda were provided. Mayor, Council, and Administrator comments were provided.

CONSENT AGENDA

Motion by Schneider, second by Ladehoff to adopt the consent agenda: APPROVE MINUTES 01/20/25 AND 01/27/25 MEETINGS AND BILL LIST \$1,668,021.76; APPROVE DECEMBER 2024 FINANCIAL STATEMENTS; RECEIPT OF BUILDING & TRADE PERMIT REPORT-JANUARY 2025; RESOLUTION 2025-017 TO APPROVE TRANSFERRING OF FUNDS FOR FISCAL YEAR 2025 THROUGH DECEMBER 31, 2024; RESOLUTION 2025-018 APPROVING CITY FEE SCHEDULE; RESOLUTION 2025-019 APPROVING PROFESSIONAL SERVICES AMENDMENT FOR THE EPA BROWNFIELDS COMMUNITY-WIDE ASSESSMENT PROJECT BF97786801, WITH EOCENE (FORMERLY IMPACT7G, INC.), IN THE AMOUNT OF \$15,927.27; RESOLUTION 2025-020 SETTING PUBLIC HEARING FOR LEASE AGREEMENT WITH CENTRAL IOWA RIVER GUN CLUB OF MARSHALLTOWN, IOWA; RESOLUTION 2025-021 DECLARING CERTAIN PROPERTY, BEING ASSETS #2761, #3103, #3112, #3274, #3357, #6225, #6574, AND #6666, SURPLUS PROPERTY AND AUTHORIZING SALE AND DISPOSAL THEREOF FROM THE PUBLIC WORKS AND PARKS & RECREATION DEPARTMENTS; RESOLUTION 2025-022 AUTHORIZING THE PURCHASE OF A TRAFFIC SIGN VINYL CUTTER AND SIGN SOFTWARE FOR THE PRICE OF \$15,869.75, PLUS SHIPPING, FROM TAPCO FOR USE AT THE STREET DIVISION AND DECLARING ASSET 5261, A 2000 CUTTER HEAD WITH ADAPTER PLATE, SURPLUS FOR DISPOSAL THEREOF; RESOLUTION 2025-023 ORDERING CONSTRUCTION OF THE EAST MAIN STREET & CENTER STREET RECONSTRUCTION PROJECT #STR22-002, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND OPINION OF PROBABLE COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS; RESOLUTION 2025-024 ORDERING CONSTRUCTION OF THE SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT #STR25-002, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND OPINION OF PROBABLE COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS; RESOLUTION 2025-025 ORDERING CONSTRUCTION OF THE WPCP SLUDGE THICKENING IMPROVEMENTS PROJECT #WPC24-001, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND OPINION OF PROBABLE COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS. Motion carried 7-0.

MOTIONS

Motion by Ladehoff, second by Fonseca to approve a Garbage and Refuse License for Knight Sanitation. Motion failed 2-5, Kell, Mitchell, Nichols, Schneider, Thompson dissenting.

Motion by Ladehoff, second by Nichols to approve Device Retailer License for Lounge on Main, 19 W Main St, Eastside Liquor & Grocery, 1116 E Nevada St, Greenleaf Tobacco & Vape, 50 Lafrentz Lane, Ste J, Depot Liquor & Grocery, 114 N Center St. Motion carried 7-0.

Motion by Schneider, second by Nichols to approve 5-day Class C Retail Alcohol License with Outdoor Service for Midnight Ballroom Rodeo at the Fairgrounds 4/19/25 with a premise update for the Central Iowa Fairgrounds to the Activities Building during this event. Motion 7-0.

RESOLUTIONS

Motion by Ladehoff, second by Schneider to adopt RESOLUTION 2025-026 APPROVING A MINIMUM ASSESSMENT AGREEMENT FOR TIMBER RIDGE SENIOR LP (dba) CLOCK TOWER SENIOR LP. Alicia Hunter, City Clerk advised the minimum assessment agreement is required to be eligible for commercial tax abatement. Motion carried 7-0.

Motion by Schneider, second by Ladehoff to adopt RESOLUTION 2025-027 APPROVING A MINIMUM ASSESSMENT AGREEMENT FOR AUST INCORPORATED (MARSHALLTOWN SELF-STORAGE). Motion carried 7-0.

Mayor Greer opened a public hearing at 5:57 pm for a purchase agreement and the conveyance and transfer of title of real property from the City of Marshalltown, Iowa to Melinda Diane Uitermarkt. No written or public comments were received. Deb Millizer, Housing and Community Development Director advised this sale is needed due to the encroachment of the shared wall that was rebuilt on the Stepping Stones building. Mayor Greer closed the public hearing at 6:03 pm. Motion by Thompson, second by Ladehoff to adopt RESOLUTION 2025-028 APPROVING A PURCHASE AGREEMENT AND PROVIDING FOR THE CONVEYANCE AND TRANSFER OF TITLE OF REAL PROPERTY FROM THE CITY OF MARSHALLTOWN, IOWA TO MELINDA DIANE UITERMARKT. Motion carried 7-0.

ORDINANCES

Mayor Greer opened a public hearing at 6:03 pm for an ordinance amendment to Chapter 156: Zoning, Ground-Mounted Solar Arrays. No written or public comments were received. Clayton Ender, Assistant Housing & Community Development Director advised the Plan and Zoning Commission held a public hearing on the amendment on 1/30/25 and unanimously approved the amendment from the maximum height of 6 feet to 10 feet for a commercial solar application. The public hearing was closed at 6:07 pm. Motion by Ladehoff, second by Mitchell to adopt the first reading of ORDINANCE 15098 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA, CHAPTER 156: ZONING, GROUND-MOUNTED SOLAR ARRAYS. Motion carried 7-0.

Motion by Ladehoff, second by Thompson to waive the second and third reading of ORDINANCE 15098 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA, CHAPTER 156: ZONING, GROUND-MOUNTED SOLAR ARRAYS. Motion carried 6-1, Mitchell dissenting.

DISCUSSION

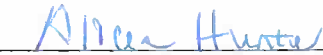
Diana Steiner, Finance Director, reviewed the proposed property tax levy for fiscal year 2026. The rate is proposed to remain at \$16, the same as FY25. The Council will set the public hearing for the tax levy at the February 24th meeting. The Employee Benefits fund and Police/Fire Retirement fund were reviewed. These costs can be reimbursed via the property tax levy for general fund employees. The debt service levy was reviewed for outstanding bonds and loans. Transit Tax Levy options at the rates of \$.40, \$.45, \$.50, \$.54, \$.60, and \$.65 were presented with the recommendation to remain at \$.40. The 2nd draft of the Capital Improvement Plan was presented with no changes.

ADJOURNMENT

The meeting adjourned at 6:41 p.m.

Respectfully Submitted,

CITY OF MARSHALLTOWN, IOWA



Alicia Hunter, City Clerk

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

BILL LIST 02/24/25

Advertising

FirstInterstate/5	1,006.93
TR/4	500.00

Consulting & Professional Fees

Bolton&Menk.Inc/2	21,360.59
Burdess, Robert/1	494.80
Cayler, Jeffrey/1	2,795.12
FirstInterstate/1	75.00
FOX Strand/1	15,092.40
Guy, Brian/1	646.00
I.L.E.A./1	200.00
Union Pac RR Co/1	3,524.34
YSS Grants Bill/1	12,597.19

Contracts

AMERICAN.LEGAL./1	500.00
BG.HVAC.INC/4	1,818.21
City.Laundering/1	134.17
Construct/2	24,665.06
DPT Services/1	2,920.00
Eocene Environ/2	19,286.89
FirstInterstate/7	2,672.94
IA.Dpt.Safety/1	300.00
Midwest.Safety./1	90.00
MRI.Software/2	19,639.32
Mtwn.Aviation/2	4,666.00
Prairie Waste/10	919.97
Region 6/2	2,115.00
Schendel.Pest.C/6	249.40
Schumacher.Elev/3	844.76
Sensys Gatso/1	9,415.00
ServiceMaster/1	1,934.00
Siemens.Indust/1	1,357.00
Stericycle.Inc/2	140.99
The Shredder/1	54.00
TOP.NOTCH.TREE./1	3,500.00
Union Pac RR Co/1	2,070.20
WRH Inc/1	370,638.20
Xerox Corp/2	46.50
Ziegler/1	741.14

Library Books

Baker & Taylor/49	3,283.30
BRODART.CO/17	2,021.25
Carnegie.Stout/1	19.00
Cengage.Learng/5	372.59
CenterPoint.Prn/3	261.87
FirstInterstate/64	2,180.31
Salem Press/1	286.00

Medical

Health.Partners/2	45,916.91
Hunter Lane LLC/1	893.05
Unity Point-Occ/4	252.00

Payroll.Net

Payroll/1	345,317.94
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Refund/Reimbursed

Atlantic.Bottli/1	-420.00
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Baker & Taylor/5	112.48
BRODART.CO/1	17.56
Edwards, Jack/1	130.00
FirstInterstate/4	62.51
Molitor LLC/1	6.00
Moreno, Elda/1	1,188.75

Service/Repairs

AAA.Septic/1	115.00
Cline, Troy/19	10,450.00
Crow,D/1	300.00
Electric.Supply/3	26.26
Evenson, Jeff/2	1,830.24
FirstInterstate/81	9,523.18
Global Paymt/1	818.48
Granite Telecom/34	1,933.88
Hach.Co/1	1,086.00
Heart.of.Iowa/3	1,041.10
IA.Treasurer/2	25,044.89
Ledford,M/2	1,650.00
McAtee.Tire/1	40.00
Mediacom/1	483.69
Menards/4	54.38
Milestone Outdo/1	462.00
Mtwn.Aviation/2	164.84
Municipal.Ergenc/1	20.57
T.S.Y.S./2	335.76
Tri.State.Lock/1	80.00
Wickham,Michael/1	610.00

Supplies/Parts

AdlandEngraving/1	2,305.50
Airgas USA/2	289.22
American.Educa./1	64.41
Armor Express/1	2,904.63
Arnold.Motor/5	547.00
Atlantic.Bottli/2	889.13
Bobcat.Ames/1	40.24
Bound.Tree.Medi/1	249.99
Carrico.Aq.Rs/1	249.35
City.Laundering/2	61.41
Cntrl.IA.Distr/2	2,152.00
Collection.Svs./5	1,228.86
Colonial.Life/1	271.49
DEMCO Inc/1	1,906.57
Doll Distrib/1	530.30
EngineeredEquip/1	2,945.90
Fidelity Secur/2	482.24
FirstInterstate/114	12,788.92
Galls.LLC/6	492.47
Gervich.Sons/3	328.00
Gillig.LLC/1	177.08
Hawkeye.Truck/1	172.98
HyVee.Accts/2	36.72
I.R.S./6	90,033.14
IA.Treasurer/2	13,969.03
IA.Water.Mgmt/1	3,435.57

BILL LIST 02/24/25

ICMA457Mission/12	22,857.10
Jensen.Inc/3	2,008.15
Kimball Midwest/1	444.68
Kriss.Premium/1	15.94
Lechnir,J/1	15.98
Marsh.Co.Engr/25	16,776.95
Menards/11	321.13
Microbac Lab/2	305.00
Midland.Scienti/6	2,249.27
Midwest.Safety./1	1,228.99
MoralesGarcia,J/1	25.00
Northern.Lights/2	1,296.09
Nutrien.Ag.Sol/1	477.00
Panther.Uniform/1	163.61
Racom.Corp/2	393.75
Regents U Minn/1	1,465.00
STAPLES/2	101.36
Streichers/4	10,982.00
Thiesens.Supply/12	1,697.05
TotalAdmin.Serv/12	9,578.79
Tri.State.Lock/1	610.00
Vajgrt.R/3	351.00
White Cap/1	107.99
WW.Grainger/2	159.20
Taxes Paid	
IA.Treasurer/2	53.33
Travel/Training	
FirstInterstate/2	923.00
Hillers,C/1	10.00
Utilities	
Alliant.Energy/40	61,092.13
ConsumersEnergy/3	392.07
Mtwn.Aviation/1	62.50
Mtwn.Wtrwrks/1	736.05
WoodRiver.Enrgy/2	4,151.39
Total/729	1,266,586.56

BILL LIST 02/24/25

Account Number	Vendor Name	Description (Item)	Amount
690.8050.5380.000	AAA Septic Service Inc	February rental	\$ 115.00
001.4041.5613.000	Adland Engraving	Indoor soccer shirts	\$ 2,305.50
001.1050.5630.000	Airgas USA Inc	Fire dept oxygen rental	\$ 82.45
001.4045.5607.000	Airgas USA Inc	Pleasant Hill pool carbon dioxide	\$ 206.77
001.1030.5481.000	Alliant Energy	2801 S 12th St EMG Sirens	\$ 25.42
001.2020.5481.000	Alliant Energy	N 18th Ave Bridge	\$ 37.85
001.4010.5481.000	Alliant Energy	Library - 105 W Boone St	\$ 2,447.24
001.4030.5481.000	Alliant Energy	Riverview Park East side	\$ 146.54
001.4030.5481.000	Alliant Energy	402 Woodland St Bath House	\$ 139.81
001.4030.5481.000	Alliant Energy	407 Marion St	\$ 26.32
001.4030.5481.000	Alliant Energy	801 Woodland St Shop	\$ 39.13
001.4030.5482.000	Alliant Energy	402 Woodland St Bath House	\$ 35.77
001.4030.5482.000	Alliant Energy	402 Woodland St Reunion Hall	\$ 108.39
001.4030.5482.000	Alliant Energy	905 E Main St Park Shop	\$ 202.53
001.4030.5482.000	Alliant Energy	402 Woodland St Comm Bldg	\$ 126.73
110.2010.5481.000	Alliant Energy	905 E Main PW Bldg	\$ 1,165.10
110.2030.5481.000	Alliant Energy	HWY 14 & HWY 30 Street lights	\$ 79.95
110.2030.5481.000	Alliant Energy	207 W Main St	\$ 57.75
110.2030.5481.000	Alliant Energy	211 S 9th St Front Terrace	\$ 22.84
110.2040.5481.000	Alliant Energy	W Meadowlane & Center St	\$ 44.53
110.2040.5481.000	Alliant Energy	S Center St & W Berle	\$ 44.43
110.2040.5481.000	Alliant Energy	E Anson St & 3rd Ave	\$ 61.18
110.2040.5481.000	Alliant Energy	N 18th Ave & E Main St	\$ 33.03
110.2040.5481.000	Alliant Energy	S 12th Ave & Olive St	\$ 42.82
110.2040.5481.000	Alliant Energy	S Center St North of Mall	\$ 51.65
110.2040.5481.000	Alliant Energy	N 3rd Ave & State St	\$ 123.21
110.2040.5481.000	Alliant Energy	W Southridge Rd & Center	\$ 44.43
110.2040.5481.000	Alliant Energy	S Center St & Hibbs Blvd	\$ 48.60
110.2040.5481.000	Alliant Energy	Riverside Dr & 3rd Ave	\$ 36.88
110.2040.5481.000	Alliant Energy	502 E Southridge Rd	\$ 24.35
610.8015.5481.000	Alliant Energy	N 3rd Ave River Sign	\$ 30.15
610.8015.5481.000	Alliant Energy	Riverview Park liftstation	\$ 71.54
610.8015.5481.000	Alliant Energy	1001 Woodland St Water Pollution	\$ 37,998.04
610.8015.5481.000	Alliant Energy	402 N 10th Ave JBS	\$ 22.69
610.8015.5482.000	Alliant Energy	1001 Woodland St Disp Plant	\$ 14,671.45
610.8016.5481.000	Alliant Energy	608 Turner St Pump Station	\$ 328.44
610.8016.5481.000	Alliant Energy	S 12th Ave corner of E Main St	\$ 148.61
610.8016.5481.000	Alliant Energy	Marion St - WPCP	\$ 228.42
610.8016.5481.000	Alliant Energy	1511 Rolling Meadows Rd	\$ 128.18
610.8016.5482.000	Alliant Energy	1001 Woodland St Shed	\$ 338.98
690.8050.5481.000	Alliant Energy	905 E Main PW Bldg	\$ 776.74
740.8065.5481.000	Alliant Energy	301 N 18TH AVE LIFTSTATION	\$ 360.55
740.8065.5481.000	Alliant Energy	N 3rd Ave - WPCP	\$ 611.02
750.8070.5481.000	Alliant Energy	901 Woodland St Compost Pile	\$ 160.84
999.1121.000	American Education Services	Wage Withholding	\$ 64.41
001.6020.5347.000	American Legal Publishing Corp	Internet renewal 3/26/25-3/26/26	\$ 500.00
030.1010.5718.000	Armor Express	Swat Vest	\$ 2,904.63
001.1010.5565.000	Arnold Motor Supply	PD 513 bulb	\$ 62.97
110.2010.5600.000	Arnold Motor Supply	Street dept hydraulics	\$ 67.77
110.2010.5718.000	Arnold Motor Supply	Service gauge, air chucks	\$ 147.24
110.2010.5718.000	Arnold Motor Supply	Service gauge and air chucks	\$ 92.74
110.2050.5600.000	Arnold Motor Supply	Power service anti-gel	\$ 176.28
001.4066.5613.000	Atlantic Bottling Co	Coliseum resale products	\$ 475.03
001.4066.5613.000	Atlantic Bottling Co	Coliseum resale products	\$ 414.10
001.4066.5980.000	Atlantic Bottling Co	Annual 2024 rebate for Coliseum products	\$ (420.00)
001.1099.5342.000	B&G HVAC INC	PF Bldg radiant tube heater repairs	\$ 995.00
001.1099.5342.000	B&G HVAC INC	PF Bldg MAU-1 repair	\$ 250.00
001.6051.5342.000	B&G HVAC INC	Carnegie Bldg OAU-1 service call	\$ 250.00
001.6051.5342.000	B&G HVAC INC	Carnegie Bldg exterior hose bib repair	\$ 323.21
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	\$ (11.99)
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	\$ 11.40
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	\$ 11.99
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	\$ 73.46
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	\$ 17.67

030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	16.14
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	14.99
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	122.45
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	35.03
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	53.60
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	145.90
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	5.99
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	44.98
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	16.79
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	261.10
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	76.92
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	23.94
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	24.50
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	96.87
030.4010.5732.000 Baker & Taylor Inc	Juvenile books	\$	131.88
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	14.22
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	89.22
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	82.83
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	45.01
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	554.09
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	50.16
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	17.10
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	64.95
030.4010.5732.000 Baker & Taylor Inc	Juvenile books	\$	92.32
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	27.90
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	286.65
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	153.05
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	68.19
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	36.21
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	33.07
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	126.50
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	27.91
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	36.48
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	30.75
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	51.28
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	16.53
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	20.52
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	51.52
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	15.00
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	18.24
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	18.24
030.4010.5732.000 Baker & Taylor Inc	Adult non fiction or fiction books	\$	42.75
170.4010.5732.000 Baker & Taylor Inc	Tye L-T books	\$	20.40
170.4010.5732.000 Baker & Taylor Inc	Tye grant book	\$	18.60
170.4010.5734.000 Baker & Taylor Inc	memorial book	\$	19.95
170.4010.5734.000 Baker & Taylor Inc	Memorial books	\$	33.62
170.4010.5734.000 Baker & Taylor Inc	West Memorial book	\$	19.95
170.4010.5734.000 Baker & Taylor Inc	memorial book	\$	14.99
170.4010.5734.000 Baker & Taylor Inc	Douds memorial boo	\$	23.97
001.4030.5565.000 Bobcat of Ames	Parks Plow bolt	\$	40.24
364.4030.5233.000 Bolton & Menk Inc	Increase	\$	5,818.45
364.4030.5233.000 Bolton & Menk Inc	Water Plaza Construction Contract	\$	15,542.14
001.1050.5630.000 Bound Tree Medical LLC	Fire dept splint kit	\$	249.99
030.4010.5732.000 Brodart Co	Juvenile books	\$	80.21
030.4010.5732.000 Brodart Co	Juvenile books	\$	148.06
030.4010.5732.000 Brodart Co	Juvenile books	\$	98.48
030.4010.5732.000 Brodart Co	Juvenile books	\$	186.68
030.4010.5732.000 Brodart Co	Juvenile books	\$	229.90
030.4010.5732.000 Brodart Co	Juvenile books	\$	60.39
030.4010.5732.000 Brodart Co	Juvenile books	\$	46.28
030.4010.5732.000 Brodart Co	Juvenile books	\$	138.94
030.4010.5732.000 Brodart Co	Juvenile books	\$	125.38
030.4010.5732.000 Brodart Co	Juvenile books	\$	57.70
030.4010.5732.000 Brodart Co	Juvenile books	\$	282.33
030.4010.5732.000 Brodart Co	Juvenile books	\$	77.66
030.4010.5732.000 Brodart Co	Juvenile books	\$	106.85
030.4010.5732.000 Brodart Co	Juvenile books	\$	55.78
030.4010.5732.000 Brodart Co	Spanish Juvenile	\$	106.73

030.4010.5732.000	Brodart Co	Juvenile books	\$	71.90
030.4010.5732.000	Brodart Co	Juvenile books	\$	147.98
170.4010.5734.000	Brodart Co	Juvenile books	\$	17.56
001.1010.5230.000	Burdess, Robert J	Police Captain Assessment Center Process	\$	494.80
001.4010.5733.000	Carnegie-Stout Public Library	Book loan	\$	19.00
001.4045.5607.000	Carrico Aquatic Resources Inc	Aquatic Center 25lb Shock treatment	\$	249.35
001.1010.5230.000	CAYLER, JEFFREY	Police Captain assessment center process	\$	2,795.12
170.4010.5732.000	Cengage Learning Inc	Tye grant books	\$	83.96
170.4010.5732.000	Cengage Learning Inc	Tye grant books	\$	49.48
170.4010.5732.000	Cengage Learning Inc	Tye grant books	\$	97.46
170.4010.5732.000	Cengage Learning Inc	Tye grant books	\$	116.95
170.4010.5732.000	Cengage Learning Inc	Tye grant books	\$	24.74
030.4010.5732.000	Center Point Large Print	Tye Grant and CIP books	\$	211.99
170.4010.5732.000	Center Point Large Print	adult fiction or non fiction	\$	23.97
170.4010.5732.000	Center Point Large Print	Tye Grant and CIP books	\$	25.91
001.4010.5600.000	Central Iowa Distributing Inc	Library bath tissue and latex gloves	\$	466.00
610.8015.5600.000	Central Iowa Distributing Inc	WPCP operating and cleaning supplies	\$	1,686.00
110.2010.5342.000	CITY LAUNDERING COMPANY	cleaning and insurance	\$	134.17
110.2010.5600.000	CITY LAUNDERING COMPANY	supplies	\$	20.24
690.8050.5132.000	CITY LAUNDERING COMPANY	Transit dept - uniform cleaning	\$	41.17
001.1075.5261.000	Cline, Troy	Junk removals 1218 E Madison	\$	960.00
001.1075.5261.000	Cline, Troy	Junk removals 1218 E Maidson	\$	690.00
001.1075.5261.000	Cline, Troy	Junk removals 1218 E Maidson	\$	590.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	1,275.00
001.1075.5261.000	Cline, Troy	land fill fees	\$	1,300.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	2,010.00
001.1075.5261.000	Cline, Troy	Junk clean ups 411 Lee St	\$	190.00
001.1075.5261.000	Cline, Troy	Junk clean ups 107 S 6th St	\$	345.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	375.00
001.1075.5261.000	Cline, Troy	Junk clean ups 511 E Boone St	\$	380.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	145.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	75.00
001.1075.5261.000	Cline, Troy	Junk clean ups 208 W Lincoln	\$	180.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	130.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	125.00
001.1075.5261.000	Cline, Troy	Junk clean ups 505 N center St	\$	760.00
001.1075.5261.000	Cline, Troy	111 S 16th St clean up	\$	280.00
001.1075.5261.000	Cline, Troy	land fill fee	\$	150.00
001.1075.5262.000	Cline, Troy	City owned snow removals	\$	490.00
999.1121.000	Collection Services Center	Child Support	\$	101.59
999.1121.000	Collection Services Center	Child Support	\$	102.11
999.1121.000	Collection Services Center	Child Support	\$	461.53
999.1121.000	Collection Services Center	Child Support	\$	139.77
999.1121.000	Collection Services Center	Child Support	\$	423.86
999.1133.000	Colonial Life	COLONIAL LIFE INSURANCE	\$	271.49
610.8016.5342.000	CONSTRUCT INC	Sanitary Sewer Point Repair on Lincoln St (T&M)	\$	5,482.06
610.8016.5342.000	CONSTRUCT INC	Sanitary Sewer Point Repair on Lincoln St (T&M)	\$	19,183.00
110.2030.5481.000	Consumers Energy Coop	City of Marshalltown	\$	74.40
110.2030.5481.000	Consumers Energy Coop	City of Marshalltown	\$	88.80
110.2040.5481.000	Consumers Energy Coop	City of Marshalltown	\$	228.87
001.4010.5343.000	Crow, Darrin	Coal Car Riggs and Little Eva	\$	300.00
001.4010.5718.000	DEMCO Inc	Quad Rotor Stand	\$	1,906.57
001.4066.5613.000	Doll Distributing LLC	Coliseum resale products	\$	530.30
001.4065.5344.000	DPT Services LLC	Coliseum HVAC preventative maint 2/1/25-1/31/26	\$	2,920.00
001.4030.5980.000	Edwards, Jack	Reunion hall rental	\$	130.00
001.1099.5410.000	Electric Supply of Marshalltown	PF Bldg emergency boiler stop button	\$	6.68
001.1099.5410.000	Electric Supply of Marshalltown	PF Bldg boiler emergency stop button	\$	2.50
110.2040.5410.000	Electric Supply of Marshalltown	Traffic signal battery backup equip	\$	17.08
610.8015.5718.000	Engineered Equipment Solutions LLC	Feed & Transfer multi chopper rebuild parts	\$	2,945.90
133.2900.5342.000	Eocene Environmental Group Inc	EPA Brownfields Assistance Program	\$	14,675.00
133.2900.5342.000	Eocene Environmental Group Inc	EPA Brownfields Assistance Program	\$	4,611.89
001.4030.5463.000	Evenson, Jeff	Lodgng 2/2-3/2/25 P&R director	\$	915.12
001.4040.5463.000	Evenson, Jeff	Loding 2/2-3/2/25 P&R director	\$	915.12
999.1125.000	Fidelity Security Life Insurance	VISION INSURANCE	\$	155.59
999.1125.000	Fidelity Security Life Insurance	VISION INSURANCE	\$	326.65
001.1010.5132.000	First Interstate Bank	MOURNING BANDS	\$	7.99
001.1010.5132.000	First Interstate Bank	INSIGNIA BRASS	\$	12.25
001.1010.5230.000	First Interstate Bank	INTEL REQUESTS	\$	75.00

001.1010.5280.000 First Interstate Bank	DIGITAL CREATOR MONTHLY SUBSCRIPTION	\$	14.99
001.1010.5280.000 First Interstate Bank	DIGITAL CREATOR MONTHLY SUBSCRIPTION	\$	14.99
001.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL	\$	125.00
001.1010.5280.000 First Interstate Bank	NOTARY RENEWAL	\$	30.00
001.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL	\$	220.00
001.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL	\$	75.00
001.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL	\$	200.00
001.1010.5360.000 First Interstate Bank	POSTAGE	\$	50.00
001.1010.5360.000 First Interstate Bank	POSTAGE	\$	16.31
001.1010.5360.000 First Interstate Bank	POSTAGE	\$	19.99
001.1010.5370.000 First Interstate Bank	BUSINESS CARDS	\$	38.58
001.1010.5370.000 First Interstate Bank	BUSINESS CARDS	\$	48.97
001.1010.5450.000 First Interstate Bank	PHONE SERVICES	\$	877.00
001.1010.5460.000 First Interstate Bank	CONFERENCE REGISTRATION	\$	575.00
001.1010.5460.000 First Interstate Bank	CONFERENCE REGISTRATION	\$	105.86
001.1010.5460.000 First Interstate Bank	REFUND FOR TRAINING WE HOSTED	\$	(750.00)
001.1010.5570.000 First Interstate Bank	FUEL	\$	21.47
001.1010.5570.000 First Interstate Bank	FUEL	\$	39.61
001.1010.5570.000 First Interstate Bank	FUEL	\$	40.96
001.1010.5600.000 First Interstate Bank	BATTERIES FOR PATROL	\$	43.49
001.1010.5600.000 First Interstate Bank	HAND WARMERS AND SHOWER CURTAIN FOR PATROL	\$	50.47
001.1010.5600.000 First Interstate Bank	PLANT SUPPLIES	\$	7.98
001.1010.5600.000 First Interstate Bank	JANITOR SUPPLIES	\$	273.00
001.1010.5600.000 First Interstate Bank	JANITOR SUPPLIES	\$	475.56
001.1010.5600.000 First Interstate Bank	BUILDING ACCESS CARDS	\$	23.98
001.1010.5600.000 First Interstate Bank	ICE	\$	9.16
001.1010.5605.000 First Interstate Bank	LAPTOP COVER	\$	31.95
001.1010.5605.000 First Interstate Bank	LAPTOP COVER	\$	68.81
001.1010.5605.000 First Interstate Bank	ENVELOPES	\$	45.06
001.1010.5605.000 First Interstate Bank	PENS FOR PATROL	\$	39.47
001.1010.5605.000 First Interstate Bank	LABEL MAKER TAPE	\$	26.10
001.1010.5605.000 First Interstate Bank	COPY PAPER	\$	81.98
001.1010.5703.000 First Interstate Bank	ADAPTOR	\$	8.99
001.1010.5980.000 First Interstate Bank	bank/vendor savings program	\$	(0.40)
001.1010.5980.000 First Interstate Bank	bank/vendor savings program	\$	(0.21)
001.1050.5132.000 First Interstate Bank	Amazon Uniform insignias	\$	23.75
001.1071.5360.000 First Interstate Bank	USPS postage Rental inspect and Finance	\$	22.63
001.1071.5360.000 First Interstate Bank	UPS section 8, rental inspection, nuisance postage	\$	100.00
001.1071.5360.000 First Interstate Bank	Endicia postage Sect 8, Rental and Nuisance	\$	100.00
001.1071.5360.000 First Interstate Bank	Endicia postage Set 8, rental and nuisance	\$	100.00
001.1071.5605.000 First Interstate Bank	Amazon Housing office supplies	\$	9.45
001.1075.5360.000 First Interstate Bank	UPS section 8, rental inspection, nuisance postage	\$	100.00
001.1075.5360.000 First Interstate Bank	Endicia - Nuisance dept postage	\$	72.81
001.1075.5360.000 First Interstate Bank	Endicia postage Sect 8, Rental and Nuisance	\$	100.00
001.1075.5360.000 First Interstate Bank	Endicia postage Set 8, rental and nuisance	\$	100.00
001.1075.5360.000 First Interstate Bank	Endicia postage Nuisance dept	\$	300.00
001.1075.5450.000 First Interstate Bank	Nuisance dept iPad	\$	41.27
001.1075.5450.000 First Interstate Bank	Nuisance cell phone	\$	24.88
001.1075.5605.000 First Interstate Bank	Amazon Housing office supplies	\$	9.45
001.1099.5410.000 First Interstate Bank	Amazon PD/ FD flush valves	\$	99.88
001.1099.5410.000 First Interstate Bank	Specified Design PF & FD boiler repairs	\$	105.59
001.1099.5611.000 First Interstate Bank	Amazon PW Bldg toilet repair, stop buttons	\$	25.98
001.2020.5450.000 First Interstate Bank	Parking cell phone	\$	24.87
001.4010.5280.000 First Interstate Bank	K. Fink ALA & PLA memberships	\$	210.00
001.4010.5342.000 First Interstate Bank	shredding services	\$	55.13
001.4010.5342.000 First Interstate Bank	bi-monthly pest control	\$	66.81
001.4010.5360.000 First Interstate Bank	postage	\$	4.40
001.4010.5360.000 First Interstate Bank	postage	\$	4.63
001.4010.5360.000 First Interstate Bank	postage	\$	5.11
001.4010.5360.000 First Interstate Bank	postage	\$	12.35
001.4010.5360.000 First Interstate Bank	postage	\$	17.64
001.4010.5360.000 First Interstate Bank	postage	\$	18.52
001.4010.5450.000 First Interstate Bank	AT&T charges	\$	33.52
001.4010.5450.000 First Interstate Bank	internet	\$	139.19
001.4010.5600.000 First Interstate Bank	plastic storage case	\$	9.99
001.4010.5600.000 First Interstate Bank	telephone headset batteries	\$	16.78
001.4010.5600.000 First Interstate Bank	supplies - sticker removal tool	\$	26.49
001.4010.5600.000 First Interstate Bank	surge protector strips	\$	31.93

001.4010.5600.000 First Interstate Bank	tape dispensers	\$	72.28
001.4010.5600.000 First Interstate Bank	supplies - batteries, caulk, clamps	\$	83.33
001.4010.5601.000 First Interstate Bank	program supplies - lemonade	\$	6.96
001.4010.5601.000 First Interstate Bank	program supply - book, laminated sheet	\$	20.45
001.4010.5601.000 First Interstate Bank	pizza for MHS book club	\$	25.52
001.4010.5601.000 First Interstate Bank	program supplies	\$	27.22
001.4010.5605.000 First Interstate Bank	2025 engagement planner	\$	20.85
001.4010.5605.000 First Interstate Bank	office supplies - bottled water	\$	31.70
001.4010.5611.000 First Interstate Bank	toilet cleaner	\$	38.67
001.4010.5741.000 First Interstate Bank	Office 2024 for public computers	\$	1,120.00
001.4030.5460.000 First Interstate Bank	ISU Even registration	\$	225.00
001.4030.5489.000 First Interstate Bank	Northern Safety safety glasses	\$	16.61
001.4030.5489.000 First Interstate Bank	Northern Safety - safety glasses	\$	141.38
001.4030.5489.000 First Interstate Bank	Northern Safety - glasses	\$	38.12
001.4030.5562.000 First Interstate Bank	Larrys Tire mower tires	\$	95.00
001.4030.5570.000 First Interstate Bank	Kwik Star rental car gas	\$	39.45
001.4030.5570.000 First Interstate Bank	Kwik Star car rental gas	\$	60.54
001.4030.5570.000 First Interstate Bank	Kwik Star car rental gas	\$	51.00
001.4030.5605.000 First Interstate Bank	Amazon Parks office supplies	\$	8.81
001.4040.5280.000 First Interstate Bank	Cricut -Design space for desktop	\$	101.63
001.4041.5380.000 First Interstate Bank	Jensen Ford Parks vehicle rental	\$	675.00
001.4041.5600.000 First Interstate Bank	KXX Shop resale sweatshirts	\$	532.60
001.4041.5601.000 First Interstate Bank	Amazon kids table and chairs	\$	124.99
001.4041.5601.000 First Interstate Bank	KXX Shop	\$	58.97
001.4065.5600.000 First Interstate Bank	Amazon electronic keypad	\$	71.99
001.4065.5600.000 First Interstate Bank	Amazon flatbed carts	\$	399.98
001.4066.5613.000 First Interstate Bank	HyVee Coliseum resale products	\$	57.86
001.4066.5613.000 First Interstate Bank	HyVee Coliseum resale products	\$	47.90
001.4066.5613.000 First Interstate Bank	HyVee Coliseum resale products	\$	61.70
001.4066.5613.000 First Interstate Bank	HyVee Coliseum resale products	\$	68.59
001.4066.5613.000 First Interstate Bank	HyVee Coliseum resale products	\$	7.96
001.4066.5613.000 First Interstate Bank	Sams Club Coliseum resale products	\$	454.16
001.4066.5613.000 First Interstate Bank	Sams Club Coliseum resale products	\$	278.84
001.6011.5460.000 First Interstate Bank	Iowa League of Cities	\$	50.00
001.6012.5460.000 First Interstate Bank	Iowa League of Cities	\$	50.00
001.6020.5210.000 First Interstate Bank	Column/ TR council proceedings, advertising	\$	422.82
001.6020.5605.000 First Interstate Bank	Staples office supplies	\$	92.69
001.6020.5605.000 First Interstate Bank	Amazon lock box for keys	\$	23.99
001.6021.5360.000 First Interstate Bank	USPS postage Rental inspect and Finance	\$	415.37
001.6021.5360.000 First Interstate Bank	USPS Finance postage	\$	438.00
001.6021.5600.000 First Interstate Bank	Amazon - door draft stopper	\$	28.99
001.6025.5210.000 First Interstate Bank	Vistaprint	\$	34.22
001.6025.5280.000 First Interstate Bank	Nat'l PELRA membership 01/01-12/31/25	\$	215.00
001.6025.5460.000 First Interstate Bank	2025 IA Employment, training, Benefits conference	\$	529.59
001.6025.5605.000 First Interstate Bank	Amazon batteries, envelope moistener	\$	39.06
001.6025.5605.000 First Interstate Bank	Amazon assorted color files	\$	20.45
001.6025.5605.000 First Interstate Bank	Amazon toner cartridges	\$	239.78
001.6025.5605.000 First Interstate Bank	Amazon printer cartridges	\$	309.78
001.6050.5410.000 First Interstate Bank	Supply House steam radiator accuators	\$	427.74
001.6050.5410.000 First Interstate Bank	Supply House	\$	(182.90)
001.6050.5410.000 First Interstate Bank	Amazon City hall light fixtures	\$	186.89
001.6050.5410.000 First Interstate Bank	Supply House steam radiator accuators	\$	427.74
001.6051.5410.000 First Interstate Bank	Radwell Int'l HVAC humidity sensor	\$	128.43
001.6051.5410.000 First Interstate Bank	Supply House exterior hose bib repair kit	\$	63.86
030.4010.5732.000 First Interstate Bank	adult non-fiction books	\$	(23.20)
030.4010.5732.000 First Interstate Bank	adult non-fiction books	\$	(15.92)
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	7.28
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	7.99
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	10.49
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	11.49
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	12.44
030.4010.5732.000 First Interstate Bank	juvenile books	\$	12.99
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	12.99
030.4010.5732.000 First Interstate Bank	adult non-fiction books	\$	13.29
030.4010.5732.000 First Interstate Bank	juvenile books	\$	13.97
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	15.92
030.4010.5732.000 First Interstate Bank	reference books	\$	15.99
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	16.45

030.4010.5732.000 First Interstate Bank	juvenile books	\$	16.99
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	17.00
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	17.76
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	17.97
030.4010.5732.000 First Interstate Bank	juvenile books	\$	18.77
030.4010.5732.000 First Interstate Bank	large-type books	\$	22.39
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	22.42
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	23.20
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	24.99
030.4010.5732.000 First Interstate Bank	adult fiction book	\$	26.39
030.4010.5732.000 First Interstate Bank	juvenile books	\$	27.05
030.4010.5732.000 First Interstate Bank	juvenile books	\$	27.40
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	29.25
030.4010.5732.000 First Interstate Bank	reference books	\$	30.58
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	31.45
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	31.79
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	32.49
030.4010.5732.000 First Interstate Bank	juvenile books	\$	34.84
030.4010.5732.000 First Interstate Bank	juvenile books	\$	37.32
030.4010.5732.000 First Interstate Bank	reference books	\$	38.99
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	39.73
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	48.10
030.4010.5732.000 First Interstate Bank	juvenile books	\$	62.00
030.4010.5732.000 First Interstate Bank	lost and replaced books	\$	94.08
030.4010.5732.000 First Interstate Bank	juvenile books	\$	134.38
030.4010.5732.000 First Interstate Bank	juvenile books	\$	165.00
030.4010.5732.000 First Interstate Bank	adult fiction books	\$	172.62
030.4010.5732.000 First Interstate Bank	adult non-fiction books	\$	172.74
110.2010.5410.000 First Interstate Bank	Amazon PW Bldg toilet repair. stop buttons	\$	29.40
110.2010.5450.000 First Interstate Bank	Street dept iPads	\$	82.54
110.2010.5450.000 First Interstate Bank	Verizon Street and Sewer cell phones	\$	51.85
110.2010.5600.000 First Interstate Bank	Amazon - PW mens shower curtain	\$	34.75
110.2010.5718.000 First Interstate Bank	Harbor Freight magnetic socket rails	\$	87.96
110.2030.5600.000 First Interstate Bank	Amazon Street light bulbs	\$	109.98
110.2030.5718.000 First Interstate Bank	Amazon clamp meter tool	\$	59.19
110.2040.5450.000 First Interstate Bank	Utility inspections	\$	61.96
110.2040.5718.000 First Interstate Bank	Amazon clamp meter tool	\$	59.20
110.2050.5600.000 First Interstate Bank	Menards snow shovel for bridges	\$	10.99
110.2060.5210.000 First Interstate Bank	Indeed Engineering job posting	\$	124.89
110.2060.5210.000 First Interstate Bank	APWA Workzone Engineering job posting	\$	375.00
110.2060.5210.000 First Interstate Bank	Hawkeye Career Fair registration CCET Students	\$	50.00
110.2060.5450.000 First Interstate Bank	Engineering GPS, JetPak, cell phones	\$	172.46
110.2060.5450.000 First Interstate Bank	Engineering GIS	\$	11.56
140.4030.5450.000 First Interstate Bank	Mediacom Parks internet	\$	169.95
140.4030.5611.000 First Interstate Bank	Weeders Digest Ice rink groomer	\$	294.01
153.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL FOR K9	\$	140.00
153.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL FOR K9	\$	140.00
153.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL FOR K9	\$	50.00
153.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL FOR K9	\$	50.00
153.1010.5280.000 First Interstate Bank	ANNUAL MEMBERSHIP RENEWAL FOR K9	\$	300.00
153.1010.5600.000 First Interstate Bank	RETIREMENT SUPPLIES	\$	64.97
153.1010.5600.000 First Interstate Bank	FOOD FOR HOSTED TRAINING	\$	64.76
153.1010.5600.000 First Interstate Bank	FOOD FOR HOSTED TRAINING	\$	28.02
153.1010.5600.000 First Interstate Bank	RETIREMENT SUPPLIES	\$	88.74
170.4010.5450.000 First Interstate Bank	Hotspots for library	\$	400.10
170.4010.5601.000 First Interstate Bank	Reach Out and Read - books	\$	26.89
170.4010.5601.000 First Interstate Bank	Reach Out and Read - books	\$	304.65
170.4010.5732.000 First Interstate Bank	DVDs	\$	(37.14)
170.4010.5732.000 First Interstate Bank	DVD refund	\$	(21.50)
170.4010.5732.000 First Interstate Bank	DVDs	\$	(17.24)
170.4010.5732.000 First Interstate Bank	DVD refund	\$	(16.98)
170.4010.5732.000 First Interstate Bank	DVD refund	\$	(14.99)
170.4010.5732.000 First Interstate Bank	DVD refund	\$	(14.39)
170.4010.5732.000 First Interstate Bank	DVD refund	\$	(8.99)
170.4010.5732.000 First Interstate Bank	DVDs	\$	6.99
170.4010.5732.000 First Interstate Bank	DVDs	\$	9.96
170.4010.5732.000 First Interstate Bank	large-type books	\$	10.91
170.4010.5732.000 First Interstate Bank	DVDs	\$	11.66

170.4010.5732.000 First Interstate Bank	DVDs	\$	11.88
170.4010.5732.000 First Interstate Bank	DVDs	\$	12.96
170.4010.5732.000 First Interstate Bank	large-type books	\$	16.70
170.4010.5732.000 First Interstate Bank	DVDs	\$	26.99
170.4010.5732.000 First Interstate Bank	DVDs	\$	29.12
170.4010.5732.000 First Interstate Bank	DVDs	\$	30.95
170.4010.5732.000 First Interstate Bank	DVDs	\$	71.29
170.4010.5732.000 First Interstate Bank	DVDs	\$	77.26
170.4010.5732.000 First Interstate Bank	DVDs	\$	77.84
170.4010.5732.000 First Interstate Bank	DVDs	\$	139.87
170.4010.5732.000 First Interstate Bank	DVDs	\$	247.30
170.4010.5734.000 First Interstate Bank	memorial book	\$	26.17
170.4010.5734.000 First Interstate Bank	memorial book	\$	36.95
181.3040.5605.000 First Interstate Bank	Amazon two pocket folders	\$	36.66
181.3040.5605.000 First Interstate Bank	Amazon labels, folders, highlighters, tabs	\$	71.03
181.3040.5605.000 First Interstate Bank	Amazon labels	\$	25.42
184.5030.5360.000 First Interstate Bank	UPS section 8, rental inspection, nuisance postage	\$	165.00
184.5030.5360.000 First Interstate Bank	Endicia online postage fee	\$	9.95
184.5030.5360.000 First Interstate Bank	Endicia postage Sect 8, Rental and Nuisance	\$	100.00
184.5030.5360.000 First Interstate Bank	Endicia postage Set 8, rental and nuisance	\$	100.00
184.5030.5605.000 First Interstate Bank	Amazon Housing office supplies	\$	9.44
610.8015.5251.000 First Interstate Bank	Iowa DNR construction permit	\$	104.04
610.8015.5280.000 First Interstate Bank	IAWEA conference registrations	\$	100.00
610.8015.5280.000 First Interstate Bank	Quill membership 1/24/25-1/23/26	\$	69.99
610.8015.5344.000 First Interstate Bank	Controlled Access monthly liftmaster subscription	\$	39.50
610.8015.5360.000 First Interstate Bank	USPS WPCP ground package	\$	12.60
610.8015.5360.000 First Interstate Bank	USPS WPCP coil of stamps	\$	73.00
610.8015.5360.000 First Interstate Bank	USPS WPCP ground package	\$	10.65
610.8015.5360.000 First Interstate Bank	USPS WPCP ground package	\$	12.15
610.8015.5360.000 First Interstate Bank	Freight Center-return pump to Mulcahy	\$	485.00
610.8015.5450.000 First Interstate Bank	WPCP cell services 750-0174, 751-0319	\$	104.92
610.8015.5450.000 First Interstate Bank	WPCP Mediacom internet	\$	75.00
610.8015.5460.000 First Interstate Bank	IAWEA conference	\$	210.00
610.8015.5460.000 First Interstate Bank	IAWEA conference registrations	\$	1,050.00
610.8015.5565.000 First Interstate Bank	Arnold Motor oil, filters, fluid, socket adapter	\$	62.13
610.8015.5565.000 First Interstate Bank	Arnold Motor refund on overcharge	\$	(3.00)
610.8015.5600.000 First Interstate Bank	Menards WPCP cleaning supplies	\$	42.34
610.8015.5600.000 First Interstate Bank	Menards WPCP oil, grease, WD-40, cleaners	\$	43.36
610.8015.5600.000 First Interstate Bank	Menards silicone sealant	\$	95.84
610.8015.5600.000 First Interstate Bank	Menards cleaning supplies, misc small parts, equip	\$	190.69
610.8015.5600.000 First Interstate Bank	Menards UV Cleaning supplies	\$	79.70
610.8015.5600.000 First Interstate Bank	Menards light bulbs, bathroom cleaners, batteries	\$	127.61
610.8015.5600.000 First Interstate Bank	Arnold Motor skid loader battery	\$	144.33
610.8015.5600.000 First Interstate Bank	Arnold Motor oil, filters, fluid, socket adapter	\$	8.89
610.8015.5600.000 First Interstate Bank	VanWall lawn mower plugs	\$	46.04
610.8015.5600.000 First Interstate Bank	Grainger heater	\$	627.10
610.8015.5600.000 First Interstate Bank	Motion Ind. V-belts for Digester #3 mixer	\$	641.51
610.8015.5600.000 First Interstate Bank	Quill chemist desk chair	\$	134.99
610.8015.5600.000 First Interstate Bank	Amazon	\$	93.78
610.8015.5603.000 First Interstate Bank	ERA qrtly Lab analysis	\$	450.87
610.8015.5603.000 First Interstate Bank	North Central Labs- glass fiber filters	\$	611.20
610.8015.5605.000 First Interstate Bank	Amazon flash drives	\$	23.59
610.8015.5605.000 First Interstate Bank	tab dividers	\$	7.92
610.8016.5450.000 First Interstate Bank	Sanitary Sewer GIS	\$	17.75
610.8016.5450.000 First Interstate Bank	Sewer dept GPS	\$	24.76
610.8016.5450.000 First Interstate Bank	Sewer dept JetPak, iPad, laptop	\$	24.76
610.8016.5450.000 First Interstate Bank	Verizon Street and Sewer cell phones	\$	25.08
610.8016.5615.000 First Interstate Bank	Menards light bulbs, bathroom cleaners, batteries	\$	51.88
690.8050.5342.000 First Interstate Bank	Rosco - GPS monitoring	\$	252.00
690.8050.5347.000 First Interstate Bank	Bosch -Cummins software 1/25-1/26	\$	1,100.00
690.8050.5410.000 First Interstate Bank	Amazon PW Bldg toilet repair, stop buttons	\$	9.80
690.8050.5470.000 First Interstate Bank	CTAA -PASS basic online course	\$	28.00
690.8050.5470.000 First Interstate Bank	Northland CDL traning	\$	895.00
690.8050.5565.000 First Interstate Bank	Amazon padlock	\$	8.99
690.8050.5565.000 First Interstate Bank	Amazon GO Cards for bus cameras	\$	564.48
690.8050.5718.000 First Interstate Bank	Amazon air hammer tool kit, wrench sets	\$	64.75
740.8065.5450.000 First Interstate Bank	Storm Sewer GIS	\$	11.96
740.8065.5450.000 First Interstate Bank	Sewer dept GPS	\$	16.51

740.8065.5450.000	First Interstate Bank	Sewer dept JetPak, iPad, laptop	\$	16.51
740.8065.5450.000	First Interstate Bank	Verizon Street and Sewer cell phones	\$	16.60
750.8070.5344.000	First Interstate Bank	Controlled Access monthly liftmaster subscription	\$	39.50
615.8015.5233.000	FOX Strand	WPC21001 WPCP Hdwks & Dig Const Ph 1/1/25-1/31/25	\$	15,092.40
001.1010.5132.000	Galls LLC	PD clothing name plates	\$	26.27
001.1010.5132.000	Galls LLC	PD employee clothing	\$	128.79
001.1010.5132.000	Galls LLC	PD eagle insignia	\$	17.04
001.1010.5132.000	Galls LLC	PD employee clothing	\$	60.99
001.1050.5132.000	Galls LLC	Fire dept employee clothing	\$	86.79
001.1050.5132.000	Galls LLC	Fire dept employee clothing	\$	172.59
110.2010.5600.000	GERVICH & SONS INC	Sign shop angle iron	\$	140.00
110.2010.5600.000	GERVICH & SONS INC	Sign shop angle iron	\$	48.00
110.2010.5600.000	GERVICH & SONS INC	Sign shop angle iron	\$	140.00
690.8050.5565.000	GILLIG LLC	Transit 101 fuel sender	\$	177.08
001.4030.5215.000	Globalpayments	Park & Rec credit card fee	\$	818.48
001.1010.5450.000	Granite Telecommunications LLC	land lines	\$	219.32
001.1010.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	324.93
001.1050.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	108.30
001.1050.5450.000	Granite Telecommunications LLC	Land Lines	\$	79.75
001.1070.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.1071.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.1075.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.4010.5450.000	Granite Telecommunications LLC	Land Lines	\$	39.88
001.4010.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	145.61
001.4030.5450.000	Granite Telecommunications LLC	Land Lines	\$	39.88
001.4040.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.4045.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.4065.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.4065.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	145.61
001.6010.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.6012.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.6020.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.6021.5450.000	Granite Telecommunications LLC	Land Lines	\$	79.71
001.6025.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
110.2010.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	72.80
110.2010.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
110.2040.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
110.2060.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
181.3040.5450.000	Granite Telecommunications LLC	Land Lines	\$	39.88
184.5030.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
610.8015.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	73.34
610.8015.5450.000	Granite Telecommunications LLC	Land Lines	\$	59.81
610.8016.5450.000	Granite Telecommunications LLC	Land Lines	\$	23.93
610.8016.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	44.00
690.8050.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	72.81
690.8050.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
740.8065.5450.000	Granite Telecommunications LLC	SIP Lines February 2025	\$	29.33
740.8065.5450.000	Granite Telecommunications LLC	Land Lines	\$	15.95
750.8070.5450.000	Granite Telecommunications LLC	Land Lines	\$	19.94
001.1010.5230.000	Guy, Brian	Police Captain Assessment Center process	\$	646.00
610.8015.5410.000	HACH COMPANY	UV Sensor annual service	\$	1,086.00
110.2050.5600.000	HAWKEYE TRUCK EQUIPMENT INC	Snow plow markers	\$	172.98
884.7010.5339.000	Health Partners	Claims 01/30-02/05	\$	41,756.74
884.7010.5339.000	Health Partners	Claims 01/30-02/05	\$	4,160.17
610.8015.5450.000	HEART OF IOWA COMMUNICATIONS CO-OP	Feb 25 Direct connect internet PW/WPCP	\$	520.55
610.8016.5450.000	HEART OF IOWA COMMUNICATIONS CO-OP	Feb 25 Direct connect internet PW/WPCP	\$	312.33
740.8065.5450.000	HEART OF IOWA COMMUNICATIONS CO-OP	Feb 25 Direct connect internet PW/WPCP	\$	208.22
001.1010.5464.000	HILLERS, CHAD A	meal during training	\$	10.00
881.1050.5339.000	Hunter Lane LLC	Paid medical claims 2/1-2/15	\$	893.05
001.4066.5613.000	HyVee Accounts Receivable	Coliseum resale products	\$	10.37
001.4066.5613.000	HyVee Accounts Receivable	Coliseum resale products	\$	26.35
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #303417ICMA DEF C	\$	1,325.00
999.1131.000	ICMA 457-Mission Square Retirement	ICMA DEF COMP	\$	269.23
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #705230	\$	133.06
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #705230	\$	1,175.00
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #705230	\$	1,042.69
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #303417	\$	2,126.38
999.1131.000	ICMA 457-Mission Square Retirement	ICMA DEFERRED COMP	\$	225.00

999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #303417ICMA DEF C	\$	5,348.00
999.1131.000	ICMA 457-Mission Square Retirement	ICMA DEF COMP	\$	230.76
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #705230	\$	1,256.92
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #705230	\$	2,351.92
999.1150.000	ICMA 457-Mission Square Retirement	EMPLOYEE RHS CONTRIBUTION	\$	7,373.14
001.1010.5230.000	ILEA	MMPI evaluation 1/21/25	\$	200.00
999.1101.000	INTERNAL REVENUE SERVICE	Bi-Weekly Federal Taxes	\$	14,016.78
999.1101.000	INTERNAL REVENUE SERVICE	Bi-Weekly Federal Taxes	\$	27,603.48
999.1103.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Social Security	\$	5,837.66
999.1103.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Social Security	\$	28,595.34
999.1107.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Medicare	\$	4,519.48
999.1107.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Medicare	\$	9,460.40
001.1010.5344.000	Iowa Dept of Public Safety	FY25 Qrtly Iowa system Jan-March 2025	\$	300.00
610.8015.5600.000	IOWA WATER MANAGEMENT CORP	WPCP hot water treatment and bags	\$	3,435.57
001.1010.5565.000	JENSEN INC	PD 531 Converter assy and core, sensors	\$	1,566.45
001.1010.5565.000	JENSEN INC	PD 514 hose assembly	\$	55.00
001.1010.5565.000	JENSEN INC	PD 514 pump assy, seals, thermostate, belts	\$	386.70
110.2010.5600.000	Kimball Midwest	Street dept paint	\$	444.68
001.6050.5600.000	KRISS PREMIUM PRODUCTS INC	YSS & City Hall Boiler chemicals	\$	15.94
001.4030.5611.000	LECHNIR, JONATHAN	Bar and chain oil	\$	15.98
110.2010.5352.000	LEDFORD, MARVIN	1608 2nd St tree removal	\$	750.00
110.2010.5352.000	LEDFORD, MARVIN	Tree removal 205 N 10th St	\$	900.00
001.1010.5570.000	Marshall County Engineer	January fuel purchases	\$	5,824.93
001.1010.5570.000	Marshall County Engineer	January fuel purchases	\$	151.29
001.1050.5570.000	Marshall County Engineer	January fuel purchases	\$	250.16
001.1050.5571.000	Marshall County Engineer	January fuel purchases	\$	855.83
001.1071.5570.000	Marshall County Engineer	January fuel purchases	\$	14.55
001.1075.5570.000	Marshall County Engineer	January fuel purchases	\$	26.52
001.1075.5570.000	Marshall County Engineer	January fuel purchases	\$	51.06
001.2020.5570.000	Marshall County Engineer	January fuel purchases	\$	51.05
001.4030.5570.000	Marshall County Engineer	January fuel purchases	\$	435.31
001.4030.5571.000	Marshall County Engineer	January fuel purchases	\$	140.08
001.5040.5570.000	Marshall County Engineer	January fuel purchases	\$	233.28
001.6050.5570.000	Marshall County Engineer	January fuel purchases	\$	131.46
110.2010.5570.000	Marshall County Engineer	January fuel purchases	\$	32.86
110.2010.5570.000	Marshall County Engineer	January fuel purchases	\$	666.06
110.2010.5571.000	Marshall County Engineer	January fuel purchases	\$	704.23
110.2050.5571.000	Marshall County Engineer	January fuel purchases	\$	1,284.24
110.2060.5570.000	Marshall County Engineer	January fuel purchases	\$	202.64
610.8015.5570.000	Marshall County Engineer	January fuel purchases	\$	621.63
610.8016.5570.000	Marshall County Engineer	January fuel purchases	\$	24.25
610.8016.5570.000	Marshall County Engineer	January fuel purchases	\$	336.73
610.8016.5571.000	Marshall County Engineer	January fuel purchases	\$	21.11
690.8050.5571.000	Marshall County Engineer	January fuel purchases	\$	4,462.96
740.8065.5570.000	Marshall County Engineer	January fuel purchases	\$	224.48
740.8065.5570.000	Marshall County Engineer	January fuel purchases	\$	16.17
740.8065.5571.000	Marshall County Engineer	January fuel purchases	\$	14.07
001.2080.5251.000	Marshalltown Aviation Inc	January Airport Monthly services & DNR tank tag	\$	134.79
001.2080.5342.000	Marshalltown Aviation Inc	January Airport Monthly services & DNR tank tag	\$	2,583.00
001.2080.5344.000	Marshalltown Aviation Inc	January Airport Monthly services & DNR tank tag	\$	2,083.00
001.2080.5450.000	Marshalltown Aviation Inc	January Airport Monthly services & DNR tank tag	\$	30.05
001.2080.5481.000	Marshalltown Aviation Inc	January Airport Monthly services & DNR tank tag	\$	62.50
610.8015.5483.000	Marshalltown Water Works	WPCP Plant water usage	\$	736.05
690.8050.5410.000	MCATEE TIRE SALES & SERVICE INC	Transit tire repair	\$	40.00
001.1099.5450.000	MEDIACOM	Police and Fire internet	\$	483.69
001.1099.5611.000	MENARDS	PF Bldg boiler emergency stop buttons	\$	38.05
001.4030.5611.000	MENARDS	77" racking wire	\$	56.97
001.4030.5611.000	MENARDS	wire brushes	\$	10.98
001.4065.5410.000	MENARDS	Coliseum fire extinguisher cabinet repair and EXIT	\$	9.52
001.4065.5410.000	MENARDS	Coliseum EXIT sign repair	\$	17.56
001.6050.5410.000	MENARDS	Utility bldg repair supplies	\$	22.05
001.6050.5600.000	MENARDS	ice melt for buildings	\$	9.99
001.6051.5410.000	MENARDS	Carnegie Bldg light switch	\$	5.25
001.6051.5600.000	MENARDS	Custodial supplies	\$	13.58
001.6051.5600.000	MENARDS	ice melt for buildings	\$	9.99
110.2010.5600.000	MENARDS	White wall panel for Street sign shop	\$	34.30
110.2010.5600.000	MENARDS	couplings and clamps	\$	6.75
110.2010.5600.000	MENARDS	Truck 44 hitch pin clips	\$	11.99

110.2010.5605.000 MENARDS	Street dept office supplies	\$	70.07
690.8050.5600.000 MENARDS	Transit 50:1 fuel premix	\$	58.46
610.8015.5603.000 Microbac Laboratories Inc	LAB analysis sludge hauling	\$	122.00
610.8015.5603.000 Microbac Laboratories Inc	LAB analysis- sludge hauling & Dig #2	\$	183.00
610.8015.5603.000 MIDLAND SCIENTIFIC INC	LAB conductivity probe	\$	233.39
610.8015.5603.000 MIDLAND SCIENTIFIC INC	LAB 0.5ml pipette	\$	634.39
610.8015.5603.000 MIDLAND SCIENTIFIC INC	LAB Whatman 90mm filter paper and ph probe	\$	934.30
610.8015.5603.000 MIDLAND SCIENTIFIC INC	LAB HyVAC vacuum pump oil	\$	285.11
610.8015.5603.000 MIDLAND SCIENTIFIC INC	LAB hydrogen perioxide solution 50%	\$	134.48
610.8015.5603.000 MIDLAND SCIENTIFIC INC	LAB Day's pinchcock clamp	\$	27.60
001.2080.5344.000 MIDWEST SAFETY COUNSELORS INC	Airport Hexane system calibration	\$	90.00
610.8015.5600.000 MIDWEST SAFETY COUNSELORS INC	Gas monitor sensors	\$	1,228.99
110.2010.5386.000 Milestone Outdoor Co	PW lawn Aeration	\$	462.00
001.2060.4875.000 Molitor LLC	overpayment on permit fees	\$	6.00
999.1166.000 Morales Garcia, Jaime	overpaid parking ticket	\$	25.00
610.8015.5980.000 Moreno, Elda	306 S 3rd St frozen pipes	\$	1,188.75
181.3040.5347.000 MRI Software LLC	Lead-MRI Software LLC	\$	1,904.95
184.5030.5347.000 MRI Software LLC	Sect 8-MRI Software LLC	\$	17,734.37
001.1050.5360.000 Municipal Emergency Services Inc	freight	\$	20.57
001.4066.5613.000 NORTHERN LIGHTS DISTRIBUTING	Coliseum resale products	\$	718.37
001.4066.5613.000 NORTHERN LIGHTS DISTRIBUTING	Coliseum resale products	\$	577.72
001.2080.5571.000 NUTRIEN AG SOLUTIONS INC	Airport Diesel for Equipment	\$	477.00
001.1050.5132.000 Panther Uniforms Inc	Fire dept uniform rank insignias	\$	163.61
Payroll #4 Payroll #4	Payroll #4 2.13.25	\$	345,317.94
001.1099.5342.000 Prairie Waste Solutions	Police and Fire Bldg	\$	124.72
001.4010.5342.000 Prairie Waste Solutions	Library	\$	121.34
001.4030.5342.000 Prairie Waste Solutions	Public Works Bldg 905 E Main	\$	24.94
001.4030.5342.000 Prairie Waste Solutions	Bullpen- Parks dept Woodland Dr	\$	99.75
001.5010.5342.000 Prairie Waste Solutions	Central Business District	\$	200.00
001.6050.5342.000 Prairie Waste Solutions	City Hall and Carnegie Bldg	\$	62.36
001.6051.5342.000 Prairie Waste Solutions	City Hall and Carnegie Bldg	\$	62.36
110.2010.5342.000 Prairie Waste Solutions	Public Works Bldg 905 E Main	\$	49.89
610.8015.5342.000 Prairie Waste Solutions	Water Pollution plant	\$	124.72
690.8050.5342.000 Prairie Waste Solutions	Public Works Bldg 905 E Main	\$	49.89
001.1010.5718.000 RACOM CORPORATION	ION battery	\$	131.25
001.1010.5718.000 RACOM CORPORATION	ION Batteries	\$	262.50
001.4010.5600.000 Regents of the UNIV OF MINNESOTA	Scanners for Library	\$	1,465.00
133.5020.5331.000 Region 6 Resource Partners	CDBG 6 townhouses Admin N 4th Ave (138) Oct-Dec 24	\$	589.00
133.5020.5331.000 Region 6 Resource Partners	CDBG HCI 6 townhomes South St 10/01-12/31/24 (139)	\$	1,526.00
030.4010.5732.000 Salem Press	reference book	\$	286.00
001.1010.5342.000 SCHENDEL PEST CONTROL INC	PD monthly service	\$	50.52
001.1050.5342.000 SCHENDEL PEST CONTROL INC	Fire dept quarterly control	\$	81.00
001.4030.5342.000 SCHENDEL PEST CONTROL INC	City Hall/ Carnegie Bldg/ Parks office	\$	22.23
001.4065.5342.000 SCHENDEL PEST CONTROL INC	Coliseum	\$	50.52
001.6050.5342.000 SCHENDEL PEST CONTROL INC	City Hall/ Carnegie Bldg/ Parks office	\$	22.23
001.6051.5342.000 SCHENDEL PEST CONTROL INC	City Hall/ Carnegie Bldg/ Parks office	\$	22.90
001.1099.5344.000 SCHUMACHER ELEVATOR COMPANY	PD & FD elevator quarterly maintenance	\$	344.19
001.6050.5344.000 SCHUMACHER ELEVATOR COMPANY	City Hall Elevator Maintenance	\$	249.02
001.6051.5344.000 SCHUMACHER ELEVATOR COMPANY	Carnegie Bldg elevator	\$	251.55
154.1011.5342.000 Sensys Gatso USA Inc.	ATE tickets	\$	9,415.00
001.4010.5342.000 ServiceMaster of Marshalltown Inc	Library February services	\$	1,934.00
001.1099.5344.000 SIEMENS INDUSTRY, INC.	PF Bldg auto control issues	\$	1,357.00
001.6050.5600.000 STAPLES BUSINESS CREDIT	City Hall/ Carnegie bldg paper towels	\$	50.68
001.6051.5600.000 STAPLES BUSINESS CREDIT	City Hall/ Carnegie bldg paper towels	\$	50.68
001.1010.5344.000 Stericycle Inc	PD services	\$	91.98
184.5030.5344.000 Stericycle Inc	Housing shredding services	\$	49.01
001.1010.5132.000 STREICHERS INC	Load Bearing Vests for MPD Officers	\$	552.00
030.1010.5718.000 STREICHERS INC	PD trauma plate	\$	280.00
030.1010.5718.000 STREICHERS INC	Load Bearing Vests for MPD Officers	\$	6,094.69
151.1010.5718.000 STREICHERS INC	Load Bearing Vests for MPD Officers	\$	4,055.31
001.4010.5342.000 The Shredder	Library services	\$	54.00
001.4030.5611.000 THEISENS SUPPLY INC	Parks couplings, adapters, elbows, valves	\$	414.78
110.2010.5132.000 THEISENS SUPPLY INC	Street employee taxable clothing	\$	39.99
110.2010.5132.000 THEISENS SUPPLY INC	Street employee taxable clothing	\$	61.69
110.2010.5132.000 THEISENS SUPPLY INC	Street dept employee clothing NON taxable	\$	15.19
110.2010.5132.000 THEISENS SUPPLY INC	Street dept employee clothing-taxable	\$	31.99
110.2010.5600.000 THEISENS SUPPLY INC	multi tool blade sets, auto bulbs, batteries	\$	61.54
110.2010.5600.000 THEISENS SUPPLY INC	lever pump, fuel pump, hitch pin	\$	56.98

110.2010.5600.000 THEISENS SUPPLY INC	rubber utility mats	\$	154.97
110.2010.5600.000 THEISENS SUPPLY INC	Truck 44 part	\$	5.98
110.2010.5718.000 THEISENS SUPPLY INC	multi tool blade sets, auto bulbs, batteries	\$	98.97
110.2010.5718.000 THEISENS SUPPLY INC	lever pump, fuel pump, hitch pin	\$	574.98
110.2030.5132.000 THEISENS SUPPLY INC	PPE Workboots Utility dept	\$	179.99
001.4040.5210.000 TIMES REPUBLICAN	January job advertisements	\$	41.66
001.4041.5210.000 TIMES REPUBLICAN	January job advertisements	\$	208.34
110.2060.5210.000 TIMES REPUBLICAN	January job advertisements	\$	166.67
690.8050.5210.000 TIMES REPUBLICAN	January job advertisements	\$	83.33
355.1075.5342.000 Top Notch Tree Service Inc	908 S 9th Ave remove 6 trees	\$	3,500.00
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX HEALTH BENEFITS	\$	1,091.63
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX HEALTH BENEFITS	\$	5,669.02
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	RBAEDKE-EXTRA PR DRAW	\$	(20.83)
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX HEALTH ROUNDING ADJ	\$	1.28
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	DMILLIZER- ADJ	\$	2.97
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	EARMARS- EXTRA TASC DRAW 2.13.25	\$	62.50
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	ANEEDHAM - EXTRA TASC DRAW	\$	104.14
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	CJONES-EXTRA TASC DRAW	\$	137.50
999.1128.000 TOTAL ADMINISTRATIVE SERVICE CORP.	TASC HEALTH ADJUSTMENTS	\$	605.61
999.1129.000 TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX DEP CARE BENEFITS	\$	416.66
999.1129.000 TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX DEP CARE BENEFITS	\$	1,091.65
999.1129.000 TOTAL ADMINISTRATIVE SERVICE CORP.	TASC DEPENDENT ADJ	\$	416.66
001.4040.5442.000 TREASURER ST OF IOWA	Sales/ Use tax	\$	7.63
001.4040.5442.000 TREASURER ST OF IOWA	Sales/ Use tax	\$	45.70
610.8015.5441.000 TREASURER ST OF IOWA	Sales/ Use tax	\$	21,467.05
610.8015.5441.000 TREASURER ST OF IOWA	Sales/ Use tax	\$	3,577.84
999.1102.000 TREASURER STATE OF IOWA	Bi-Weekly Payroll SIT	\$	4,568.79
999.1102.000 TREASURER STATE OF IOWA	Bi-Weekly Payroll SIT	\$	9,400.24
001.4010.5410.000 Tri State Lock Service	Library east door service call and repair	\$	80.00
110.2010.5611.000 Tri State Lock Service	Street mechanics office door lock	\$	610.00
001.4010.5215.000 TSYS	Library credit card transaction fees	\$	91.80
001.6021.5215.000 TSYS	Finance credit card transaction fees	\$	243.96
363.2010.5230.000 UNION PACIFIC RAILROAD COMPANY	Reimbursement Agreement	\$	3,524.34
363.2012.5331.000 UNION PACIFIC RAILROAD COMPANY	PE Agreement for 6th St and 12th St	\$	2,070.20
110.2010.5339.000 Unity Point- Occupational Medicine	Random drug testing	\$	168.00
610.8015.5339.000 Unity Point- Occupational Medicine	Random drug testing	\$	42.00
610.8016.5339.000 Unity Point- Occupational Medicine	Random drug testing	\$	25.20
740.8065.5339.000 Unity Point- Occupational Medicine	Random drug testing	\$	16.80
001.1050.5718.000 Vajgrt, Roger	Carbide chain and filler cap	\$	96.00
001.1050.5718.000 Vajgrt, Roger	carbide chain	\$	90.00
110.2010.5600.000 Vajgrt, Roger	Street dept saw chains	\$	165.00
110.2050.5600.000 White Cap	wire tires for snow fence	\$	107.99
001.4040.5358.000 Wickham, Michael	classes 2/11-3/18	\$	610.00
110.2010.5482.000 WoodRiver Energy LLC	905 E Main St	\$	2,490.83
690.8050.5482.000 WoodRiver Energy LLC	905 E Main St	\$	1,660.56
615.8015.5342.000 WRH Inc	WPC21001 1/4/25-2/3/25	\$	370,638.20
110.2010.5600.000 WW GRAINGER	PW bldg custodial supplies	\$	119.40
690.8050.5600.000 WW GRAINGER	PW bldg custodial supplies	\$	39.80
001.4010.5344.000 Xerox Corp	Library contract and copies	\$	22.76
610.8015.5344.000 Xerox Corp	January Xerox and copies	\$	23.74
389.1010.5230.000 YSS Grants Billing	YSS MPACT Services	\$	12,597.19
001.6050.5342.000 Ziegler Inc	YSS Bldg ONAN service call	\$	741.14
TOTAL		\$	1,266,586.56

MARSHALLTOWN

I O W A

Jill Petermeier
Human Resource Director
24 North Center Street
Marshalltown, IA 50158
Tel (641) 754-5704 Fax (641) 844-1899
jpetermeier@marshalltown-ia.gov

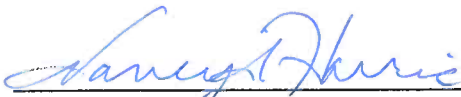
To: Civil Service Commission
From: Chief Chris Jones – Police Department
Re: Promotional Hire List
Position: Police Captain

After reviewing all applicants and their qualifications, the following people were tested, interviewed, and considered to best meet the qualifications for the above listed position:

Sadie Weekley	389.01/490
Chad Hillers	379.17/490
Chris Roush	363.17/490
Justin Allen	353.34/490

This list is good until: February 19, 2027

Date List Certified by Civil Service Commission: February 19, 2025



Nancy Harris, Civil Service Commission Chair

Attest:



Alicia Hunter, Clerk of the Commission

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor and City Council
FROM: Diana Steiner, Finance Director
DATE: February 12, 2025
RE: January 2025 Monthly Financial Statements

Strategic Plan Objective: N/A

Recommendation: Staff recommends approving the January 2025 monthly financial statements.

Budget Impact: N/A

Description/Background: The Finance Department has prepared and reconciled the January 2025 financial statements for your review. The budgeted amounts shown are based on the FY25 budget approved in April 2024.

The attached reports include the following:

- Fund Balance Report, which includes the beginning balance at 6/30/24, the year-to-date revenues and expenses for 7 months and the ending fund cash balance at 1/31/25.
- Cash & Investments Report, which includes current balances and interest rates for all city investments.
- Monthly Budget Report, which reflects monthly and year-to-date revenues and expenses by each fund and then in summary. If the YTD Activity amount is less than the YTD Budget amount, it will show as unfavorable for revenues and favorable for expenses.

Items of interest this month:

- \$385,145 was spent in fund 615 for the IFA SRF Headworks project.
- \$890.739 was received by the SRF for the WPCP Headworks & Digester project, fund 615.
- There were 3 payrolls that posted in January.

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



MARSHALLTOWN

IOWA

FUND BALANCE REPORT AS OF 1/31/2025

Fund	Beginning Balance	Total Revenues	Total Expenses	Ending Balance
001 - GENERAL FUND	\$ 3,687,037.61	\$ 10,131,627.13	\$ 11,128,336.75	\$ 2,690,327.99
010 - CASH FLOW RESERVE FUND	\$ 3,177,063.33	\$ 87,818.78	\$ -	\$ 3,264,882.11
011 - INSURANCE DEDUCTIBLE RESERVE FUND	\$ 150,915.42	\$ 106,132.69	\$ -	\$ 257,048.11
030 - CAPITAL RESERVE	\$ -	\$ 504,683.37	\$ 504,683.37	\$ -
031 - CAPITAL RSRV-BLDG MAINT	\$ 245,379.23	\$ 6,782.66	\$ -	\$ 252,161.89
032 - CIP LARGE VEHICLE/EQUIPMENT	\$ 121,216.00	\$ -	\$ -	\$ 121,216.00
110 - ROAD USE TAX	\$ 9,861,740.78	\$ 2,905,939.49	\$ 1,617,802.72	\$ 11,149,877.55
111 - ROAD USE TAX INSURANCE RESERVE	\$ 50,305.14	\$ 26,579.09	\$ -	\$ 76,884.23
112 - EMPLOYEE BENEFITS FUND	\$ 3,290,079.09	\$ 1,743,327.48	\$ 1,634,956.49	\$ 3,398,450.08
117 - POLICE/FIRE RETIREMENT	\$ 520,899.23	\$ 716,920.54	\$ 609,381.25	\$ 628,438.52
119 - EMERGENCY FUND	\$ -	\$ 1,905.08	\$ 1,903.04	\$ 2.04
121 - LOCAL OPTION SALES TAX	\$ 5,529,671.37	\$ 2,808,998.18	\$ 2,027,004.89	\$ 6,311,664.66
125 - TAX INCREMENT FINANCING	\$ 613,314.23	\$ 876,568.64	\$ 576,886.46	\$ 912,996.41
130 - CITY TORT LIABILITY	\$ 46,803.48	\$ 64,634.48	\$ 45,495.38	\$ 65,942.58
132 - GRANTS-STATE/LOCAL AGENCIES	\$ (34,428.79)	\$ 440,467.40	\$ 640,827.77	\$ (234,789.16)
133 - UNDESIGNATED FEDERAL GRANTS	\$ (204,480.70)	\$ 1,068,859.12	\$ 981,136.02	\$ (116,757.60)
140 - PARK & REC DONATION FUND	\$ 248,283.06	\$ 242,775.72	\$ 68,572.61	\$ 422,486.17
141 - MTOWN TENNIS ASSOC	\$ 3,021.12	\$ 83.50	\$ -	\$ 3,104.62
142 - SOFTBALL ASSOCIATION FUND	\$ 35.77	\$ 24,014.30	\$ 25,429.95	\$ (1,379.88)
144 - LIVE HEALTHY IOWA	\$ 9,788.02	\$ 270.55	\$ -	\$ 10,058.57
145 - TORNADO GENERAL	\$ 287,863.02	\$ -	\$ 247,863.02	\$ 40,000.00
149 - FEMA - WINDS	\$ 346,964.14	\$ -	\$ -	\$ 346,964.14
150 - LOCAL PD GRANTS	\$ (7,716.13)	\$ 34,087.21	\$ 37,115.39	\$ (10,744.31)
151 - DEPT OF JUSTICE GRANTS	\$ (744.48)	\$ 3,482.46	\$ 10,852.51	\$ (8,114.53)
152 - POLICE UNDESIGNATED GRANTS	\$ (11,402.99)	\$ 71,231.80	\$ 65,475.17	\$ (5,646.36)
153 - POLICE DEPT DONATION FUND	\$ 90,440.95	\$ 7,173.62	\$ 8,543.10	\$ 89,071.47
154 - AUTOMATED TRAFFIC ENFORCEMENT	\$ -	\$ 178,368.01	\$ 93,296.65	\$ 85,071.36
156 - FIRE DEPT DONATION FUND	\$ 55,438.04	\$ 5,135.72	\$ 10,675.59	\$ 49,898.17
160 - ECONOMIC DEVELOPMENT GIFT	\$ 57,456.74	\$ 1,588.20	\$ -	\$ 59,044.94
161 - SURETY DEPOSITS/SUBDIVIDER	\$ 11,986.98	\$ 331.36	\$ -	\$ 12,318.34
170 - LIBRARY DONATION FUND	\$ 146,326.59	\$ 24,084.36	\$ 11,882.33	\$ 158,528.62
177 - SEIZED ASSETS (POLICE)	\$ 17,508.42	\$ 303.86	\$ 2,846.65	\$ 14,965.63
181 - #7 HUD LEAD GRANT	\$ (52,528.34)	\$ 215,981.25	\$ 416,722.72	\$ (253,269.81)
184 - VOUCHERS - 002, 003	\$ 321,431.84	\$ 917,549.22	\$ 893,954.25	\$ 345,026.81
189 - #6 HUD LEAD GRANT/NOW STATE FUNDS ONLY	\$ 157,746.74	\$ 4,360.81	\$ -	\$ 162,107.55
200 - GO BONDS DEBT FUND	\$ 379,824.34	\$ 2,864,733.56	\$ 991,795.30	\$ 2,252,762.60
300 - CIP COLLECTION FUND	\$ 580,509.96	\$ 405,659.96	\$ 504,642.30	\$ 481,527.62
311 - RISE STREET GRANTS	\$ (258,823.17)	\$ 319,534.62	\$ 63,831.35	\$ (3,119.90)
312 - AIRPORT PROJECT FUND	\$ (29,787.04)	\$ 2.08	\$ 4,096.46	\$ (33,881.42)
320 - SPECIAL ASSESSMENT PROJECTS	\$ (14,510.95)	\$ -	\$ -	\$ (14,510.95)
340 - BIKE PATH PROJECT FUND	\$ (2,293.20)	\$ -	\$ 8,132.67	\$ (10,425.87)
341 - TREES FOREVER PROJECT	\$ 22,443.93	\$ 6,636.67	\$ 13,459.47	\$ 15,621.13
350 - GO BONDS CAPITAL PROJECTS	\$ 9,765.35	\$ 269.94	\$ -	\$ 10,035.29
355 - Dangerous & Dilapidated (included GO bonds)	\$ 220,601.23	\$ 15,131.47	\$ 15,326.83	\$ 220,405.87
363 - 2021 GO BONDS	\$ 7,082,438.67	\$ 548,962.53	\$ 2,996,837.16	\$ 4,634,564.04
364 - 2022 GO BONDS	\$ 10,153,234.52	\$ 426,982.78	\$ 1,321,657.05	\$ 9,258,560.25
365 - 2023 GO BONDS	\$ 9,999,880.79	\$ 302,410.01	\$ 17,500.00	\$ 10,284,790.80
389 - AMERICAN RESCUE PLAN	\$ 469,691.54	\$ -	\$ 145,831.29	\$ 323,860.25
395 - ECONOMIC DEVELOPMENT PROJECT FUND	\$ (91,760.00)	\$ 97,265.60	\$ -	\$ 5,505.60
610 - WATER POLLUTION CONTROL	\$ -	\$ 2,665,913.56	\$ 2,665,913.56	\$ -
611 - WPCP REVENUE	\$ 24,677,050.67	\$ 5,561,733.21	\$ 3,364,125.69	\$ 26,874,658.19
614 - WPCP CAPITAL IMPROVEMENT RSRV	\$ 1,171,478.19	\$ 32,381.41	\$ -	\$ 1,203,859.60
615 - WPCP PLANT & IMPROVEMENTS	\$ -	\$ 3,310,315.98	\$ 3,339,152.73	\$ (28,836.75)
616 - SANITARY SEWER REHAB PROJECT	\$ (0.03)	\$ 101,942.77	\$ 245,251.72	\$ (143,308.98)
617 - SANITARY SEWER NEW CONSTRUCTN	\$ 181,375.85	\$ 6,698.00	\$ -	\$ 188,073.85
618 - WPCP INSURANCE RESERVE (WAS TORNADO)	\$ 100,610.28	\$ 103,535.29	\$ -	\$ 204,145.57
690 - TRANSIT OPERATING	\$ 1,205,433.62	\$ 523,427.92	\$ 551,168.32	\$ 1,177,693.22
691 - TRANSIT INSURANCE RESERVE	\$ 25,152.57	\$ 695.25	\$ -	\$ 25,847.82
740 - STORM SEWER UTILITY	\$ 2,624,054.45	\$ 955,546.29	\$ 597,580.43	\$ 2,982,020.31
750 - COMPOSTING FACILITY	\$ 241,394.12	\$ 53,864.15	\$ 101,557.26	\$ 193,701.01
760 - P&R CONCESSIONS ENTERPRISE	\$ 1,457.86	\$ 33,208.44	\$ 44,577.56	\$ (9,911.26)
881 - OCCUPATIONAL INSURANCE ESCROW	\$ 201,247.45	\$ 107,548.42	\$ 16,850.36	\$ 291,945.51
884 - GROUP HEALTH INSURANCE ESCROW	\$ 65,001.64	\$ 2,329,287.95	\$ 1,803,375.94	\$ 590,913.65
886 - WORKMAN'S COMP DEDUCTIBLE FUND	\$ 36,391.55	\$ 1,003.00	\$ 356.04	\$ 37,038.51
913 - 911 COMMISSION	\$ (126,387.00)	\$ 912,413.99	\$ 986,259.31	\$ (200,232.32)
	<u>\$ 87,662,892.10</u>	<u>\$ 44,909,170.93</u>	<u>\$ 41,460,922.88</u>	<u>\$ 91,111,140.15</u>

MARSHALLTOWN

IOWA

CASH AND INVESTMENTS
AS OF 1/31/25

Account	Name	Ending Balance	Interest Rate
BalObject: 0110 - P&R Deposits			
<u>999.0110.100</u>	First Interstate Bank P&R Deposits	<u>47,324.03</u>	3.30
	Total BalObject: 0110 - P&R Deposits :	47,324.03	
BalObject: 0111 - Operating			
<u>999.0111.100</u>	First Interstate Bank Operating	<u>757,048.27</u>	3.30
	Total BalObject: 0111 - Operating:	757,048.27	
BalObject: 0113 - Payroll			
<u>999.0113.100</u>	First Interstate Bank Payroll	<u>425,000.00</u>	3.30
	Total BalObject: 0113 - Payroll:	425,000.00	
BalObject: 0115 - HUD Admin			
<u>999.0115.100</u>	First Interstate Bank HUD Admin	<u>344,508.19</u>	3.30
	Total BalObject: 0115 - HUD Admin:	344,508.19	
BalObject: 0116 - HUD HAP			
<u>999.0116.100</u>	First Interstate Bank HUD HAP	<u>11,770.10</u>	3.30
	Total BalObject: 0116 - HUD HAP:	11,770.10	
BalObject: 0117 - Police			
<u>999.0117.100</u>	First Interstate Bank Police	<u>15,220.63</u>	3.30
	Total BalObject: 0117 - Police:	15,220.63	
BalObject: 0117 - ACH			
<u>999.0118.100</u>	First Interstate Bank ACH	<u>1,000.00</u>	3.30
	Total BalObject: 0118 - ACH	1,000.00	
BalObject: 0120 - PETTY CASH			
<u>001.0120.000</u>	PETTY CASH - RECORDS	<u>100.00</u>	0.00
<u>144.0120.000</u>	PETTY CASH-TRACK MEET	-	0.00
<u>750.0120.000</u>	PETTY CASH	-	0.00
<u>760.0120.000</u>	PETTY CASH	-	0.00
	Total BalObject: 0120 - PETTY CASH:	100.00	
BalObject: 0122 - PETTY CASH-CITY CLERK			
<u>001.0122.000</u>	PETTY CASH-CITY CLERK	<u>200.00</u>	0.00
	Total BalObject: 0122 - PETTY CASH-CITY CLERK:	200.00	
Page 1:2			
BalObject: 0123 - PETTY CASH-LIBRARY			
<u>001.0123.000</u>	PETTY CASH-LIBRARY	<u>100.00</u>	0.00
	Total BalObject: 0123 - PETTY CASH-LIBRARY:	100.00	

Account	Name	Ending Balance	Interest Rate
BalObject: 0124 - PETTY CASH-LIBRARY			
<u>001.0125.000</u>	PETTY CASH-LIBRARY	200.00	0.00
	Total BalObject: 0124 - PETTY CASH-LIBRARY:	200.00	
BalObject: 0125 - PETTY CASH-PARK			
<u>001.0125.000</u>	PETTY CASH-PARK	225.00	0.00
	Total BalObject: 0125 - PETTY CASH-PARK:	225.00	
BalObject: 0130 - CASH HELD BY INSUR ADMIN			
<u>885.0130.000</u>	CASH HELD BY INSUR ADMI	1.00	0.00
	Total BalObject: 0130 - CASH HELD BY INSUR ADM	1.00	
BalObject: 0215 - IPAIT MONEY MARKET			
<u>999.0215.000</u>	IPAIT MONEY MARKET	38,013,192.34	4.18
	Total BalObject: 0215 - IPAIT MONEY MARKET:	38,013,192.34	
BalObject: 0216 - FIRST INTERSTATE BANK MM			
<u>999.0216.000</u>	First Interstate Bank MM	6,422,417.08	3.30
	Total BalObject: 0216 - FIRST INTERSTATE BANK M	6,422,417.08	
BalObject: 0240 - MIDWEST ONE CD (91-365 DAYS)			
<u>364.0240.000</u>	MIDWEST ONE CD	-	
<u>999.0240.000</u>	MIDWEST ONE CD	2,024,410.95	4.95
	Total BalObject: 0240 - MIDWEST ONE CD	2,024,410.95	
BalObject: 0243 - GNB INV			
<u>365.0243.000</u>	GNB CD	-	
<u>999.0243.000</u>	GNB CD	6,000,000.00	4.12-4.51
	Total BalObject: 0243 - GNB INV	6,000,000.00	
BalObject: 0246 - PINNACLE INV			
<u>365.0246.000</u>	PINNACLE CD	-	
<u>999.0246.000</u>	PINNACLE CD	31,000,000.00	4.40-5.30
	Total BalObject: 0246 - PINNACLE CD	31,000,000.00	
BalObject: 0248 - Alerus Financial			
<u>999.0248.000</u>	Alerus CD	1,000,000.00	4.26
	Total BalObject: 0248 - ALERUS CD	1,000,000.00	
BalObject: 0249 - United Bank & Trust			
<u>999.0249.000</u>	UB&T CD	1,000,000.00	4.75
	Total BalObject: 0265 - UB&T CD	1,000,000.00	
BalObject: 0265 - IPAIT CD			
<u>999.0265.000</u>	IPAIT CD	2,000,000.00	5.14
	Total BalObject: 0265 - IPAIT CD	2,000,000.00	
BalObject: 0273 - IPAIT GOV SEC			
<u>999.0273.000</u>	IPAIT GOV INV	1,999,990.03	4.81
	Total BalObject: 0273 - IPAIT GOV SEC	1,999,990.03	
BalObject: 0999 - POOLED CASH			
<u>999.0999.000</u>	POOLED CASH - prepaid work comp and outstanding AP	48,432.53	0.00
	Total BalObject: 0999 - POOLED CASH:	48,432.53	
Page 2:2	TOTAL	91,111,140.15	



City of Marshalltown, IA

Monthly Budget Report - Marshalltown

Group Summary

For Fiscal: 2024-2025 Period Ending: 01/31/2025

Account Typ...	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 001 - GENERAL FUND					
Revenue	240,412.44	12,105,388.19	10,131,627.13	-1,973,761.06	20,752,147.00
Expense	1,825,235.46	12,101,487.79	11,128,336.75	973,151.04	20,752,147.00
Total Fund: 001 - GENERAL FUND:	-1,584,823.02	3,900.40	-996,709.62	-1,000,610.02	0.00
Fund: 010 - CASH FLOW RESERVE FUND					
Revenue	14,916.73	197,779.75	87,818.78	-109,960.97	339,051.00
Total Fund: 010 - CASH FLOW RESERVE FUND:	14,916.73	197,779.75	87,818.78	-109,960.97	339,051.00
Fund: 011 - INSURANCE DEDUCTIBLE RESERVE FUND					
Revenue	1,174.41	0.00	106,132.69	106,132.69	0.00
Total Fund: 011 - INSURANCE DEDUCTIBLE RESERVE FUND:	1,174.41	0.00	106,132.69	106,132.69	0.00
Fund: 030 - CAPITAL RESERVE					
Revenue	12,257.90	422,391.62	504,683.37	82,291.75	724,100.00
Expense	12,257.90	422,315.67	504,683.37	-82,367.70	724,100.00
Total Fund: 030 - CAPITAL RESERVE:	0.00	75.95	0.00	-75.95	0.00
Fund: 031 - CAPITAL RSRV-BLDG MAINT					
Revenue	1,152.09	1,166.62	6,782.66	5,616.04	2,000.00
Expense	0.00	27,222.30	0.00	27,222.30	46,667.00
Total Fund: 031 - CAPITAL RSRV-BLDG MAINT:	1,152.09	-26,055.68	6,782.66	32,838.34	-44,667.00
Fund: 032 - CIP LARGE VEHICLE/EQUIPMENT					
Revenue	0.00	59,495.87	0.00	-59,495.87	101,993.00
Total Fund: 032 - CIP LARGE VEHICLE/EQUIPMENT:	0.00	59,495.87	0.00	-59,495.87	101,993.00
Fund: 110 - ROAD USE TAX					
Revenue	379,432.60	2,261,250.11	2,905,939.49	644,689.38	3,876,429.00
Expense	54,098.20	2,013,642.12	1,617,802.72	395,839.40	3,451,963.00
Total Fund: 110 - ROAD USE TAX:	325,334.40	247,607.99	1,288,136.77	1,040,528.78	424,466.00
Fund: 111 - ROAD USE TAX INSURANCE RESERVE					
Revenue	351.27	0.00	26,579.09	26,579.09	0.00
Total Fund: 111 - ROAD USE TAX INSURANCE RESERVE:	351.27	0.00	26,579.09	26,579.09	0.00
Fund: 112 - EMPLOYEE BENEFITS FUND					
Revenue	29,759.56	1,697,554.18	1,743,327.48	45,773.30	2,910,093.00
Expense	0.00	2,120,988.87	1,634,956.49	486,032.38	3,635,981.00
Total Fund: 112 - EMPLOYEE BENEFITS FUND:	29,759.56	-423,434.69	108,370.99	531,805.68	-725,888.00

Monthly Budget Report - Marshalltown

For Fiscal: 2024-2025 Period Ending: 01/31/2025

Account Typ...	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 117 - POLICE/FIRE RETIREMENT					
Revenue	8,910.57	799,513.54	716,920.54	-82,593.00	1,370,595.00
Expense	0.00	758,567.25	609,381.25	149,186.00	1,300,401.00
Total Fund: 117 - POLICE/FIRE RETIREMENT:	8,910.57	40,946.29	107,539.29	66,593.00	70,194.00
Fund: 119 - EMERGENCY FUND					
Revenue	0.00	0.00	1,905.08	1,905.08	0.00
Expense	0.00	0.00	1,903.04	-1,903.04	0.00
Total Fund: 119 - EMERGENCY FUND:	0.00	0.00	2.04	2.04	0.00
Fund: 121 - LOCAL OPTION SALES TAX					
Revenue	512,820.12	2,396,333.31	2,808,998.18	412,664.87	4,108,000.00
Expense	82,681.00	3,317,741.42	2,027,004.89	1,290,736.53	5,687,559.00
Total Fund: 121 - LOCAL OPTION SALES TAX:	430,139.12	-921,408.11	781,993.29	1,703,401.40	-1,579,559.00
Fund: 125 - TAX INCREMENT FINANCING					
Revenue	17,955.42	875,619.99	876,568.64	948.65	1,501,063.00
Expense	0.00	903,660.31	576,886.46	326,773.85	1,549,132.00
Total Fund: 125 - TAX INCREMENT FINANCING:	17,955.42	-28,040.32	299,682.18	327,722.50	-48,069.00
Fund: 126 - TIF-LMI					
Revenue	0.00	5,507.18	0.00	-5,507.18	9,441.00
Total Fund: 126 - TIF-LMI:	0.00	5,507.18	0.00	-5,507.18	9,441.00
Fund: 130 - CITY TORT LIABILITY					
Revenue	12,300.61	23,916.62	64,634.48	40,717.86	41,000.00
Expense	13,500.70	23,333.31	45,495.38	-22,162.07	40,000.00
Total Fund: 130 - CITY TORT LIABILITY:	-1,200.09	583.31	19,139.10	18,555.79	1,000.00
Fund: 132 - GRANTS-STATE/LOCAL AGENCIES					
Revenue	20,659.00	1,593,703.79	440,467.40	-1,153,236.39	2,732,391.79
Expense	0.00	1,334,826.64	640,827.77	693,998.87	2,288,274.40
Total Fund: 132 - GRANTS-STATE/LOCAL AGENCIES:	20,659.00	258,877.15	-200,360.37	-459,237.52	444,117.39
Fund: 133 - UNDESIGNATED FEDERAL GRANTS					
Revenue	13,542.40	583,333.31	1,068,859.12	485,525.81	1,000,000.00
Expense	87,020.87	578,374.86	981,136.02	-402,761.16	991,500.00
Total Fund: 133 - UNDESIGNATED FEDERAL GRANTS:	-73,478.47	4,958.45	87,723.10	82,764.65	8,500.00
Fund: 140 - PARK & REC DONATION FUND					
Revenue	43,763.77	30,333.24	242,775.72	212,442.48	52,000.00
Expense	10,817.80	32,024.86	68,572.61	-36,547.75	54,900.00
Total Fund: 140 - PARK & REC DONATION FUND:	32,945.97	-1,691.62	174,203.11	175,894.73	-2,900.00
Fund: 141 - MTOWN TENNIS ASSOC					
Revenue	14.18	11.62	83.50	71.88	20.00
Total Fund: 141 - MTOWN TENNIS ASSOC:	14.18	11.62	83.50	71.88	20.00

Monthly Budget Report - Marshalltown

For Fiscal: 2024-2025 Period Ending: 01/31/2025

Account Typ...	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 142 - SOFTBALL ASSOCIATION FUND					
Revenue	23,999.47	17,941.00	24,014.30	6,073.30	30,756.00
Expense	278.02	17,924.27	25,429.95	-7,505.68	30,756.00
Total Fund: 142 - SOFTBALL ASSOCIATION FUND:	23,721.45	16.73	-1,415.65	-1,432.38	0.00
Fund: 144 - LIVE HEALTHY IOWA					
Revenue	45.96	4,401.81	270.55	-4,131.26	7,546.00
Expense	0.00	4,401.39	0.00	4,401.39	7,546.00
Total Fund: 144 - LIVE HEALTHY IOWA :	45.96	0.42	270.55	270.13	0.00
Fund: 145 - TORNADO GENERAL					
Expense	0.00	76,920.62	247,863.02	-170,942.40	131,864.00
Total Fund: 145 - TORNADO GENERAL:	0.00	76,920.62	247,863.02	-170,942.40	131,864.00
Fund: 150 - LOCAL PD GRANTS					
Revenue	4,886.63	34,986.00	34,087.21	-898.79	60,000.00
Expense	6,651.97	34,986.00	37,115.39	-2,129.39	60,000.00
Total Fund: 150 - LOCAL PD GRANTS:	-1,765.34	0.00	-3,028.18	-3,028.18	0.00
Fund: 151 - DEPT OF JUSTICE GRANTS					
Revenue	2,447.46	12,129.53	3,482.46	-8,647.07	20,800.00
Expense	0.00	12,131.35	10,852.51	1,278.84	20,800.00
Total Fund: 151 - DEPT OF JUSTICE GRANTS:	2,447.46	-1.82	-7,370.05	-7,368.23	0.00
Fund: 152 - POLICE UNDESIGNATED GRANTS					
Revenue	17,286.00	54,254.06	71,231.80	16,977.74	93,007.00
Expense	11,782.27	54,234.18	65,475.17	-11,240.99	93,007.00
Total Fund: 152 - POLICE UNDESIGNATED GRANTS:	5,503.73	19.88	5,756.63	5,736.75	0.00
Fund: 153 - POLICE DEPT DONATION FUND					
Revenue	1,802.95	1,866.62	7,173.62	5,307.00	3,200.00
Expense	50.00	17,989.72	8,543.10	9,446.62	30,850.00
Total Fund: 153 - POLICE DEPT DONATION FUND:	1,752.95	-16,123.10	-1,369.48	14,753.62	-27,650.00
Fund: 154 - AUTOMATED TRAFFIC ENFORCEMENT					
Revenue	26,934.93	0.00	178,368.01	178,368.01	0.00
Expense	11,550.00	0.00	93,296.65	-93,296.65	0.00
Total Fund: 154 - AUTOMATED TRAFFIC ENFORCEMENT:	15,384.93	0.00	85,071.36	85,071.36	0.00
Fund: 156 - FIRE DEPT DONATION FUND					
Revenue	347.98	1,749.93	5,135.72	3,385.79	3,000.00
Expense	0.00	18,666.62	10,675.59	7,991.03	32,000.00
Total Fund: 156 - FIRE DEPT DONATION FUND:	347.98	-16,916.69	-5,539.87	11,376.82	-29,000.00
Fund: 160 - ECONOMIC DEVELOPMENT GIFT					
Revenue	269.77	583.31	1,588.20	1,004.89	1,000.00
Total Fund: 160 - ECONOMIC DEVELOPMENT GIFT:	269.77	583.31	1,588.20	1,004.89	1,000.00

Monthly Budget Report - Marshalltown

For Fiscal: 2024-2025 Period Ending: 01/31/2025

Account Typ...	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 161 - SURETY DEPOSITS/SUBDIVIDER					
Revenue	56.28	107.87	331.36	223.49	185.00
Total Fund: 161 - SURETY DEPOSITS/SUBDIVIDER:	56.28	107.87	331.36	223.49	185.00
Fund: 170 - LIBRARY DONATION FUND					
Revenue	1,569.31	364,276.99	24,084.36	-340,192.63	624,475.00
Expense	4,259.27	370,264.79	11,882.33	358,382.46	634,740.00
Total Fund: 170 - LIBRARY DONATION FUND:	-2,689.96	-5,987.80	12,202.03	18,189.83	-10,265.00
Fund: 177 - SEIZED ASSETS (POLICE)					
Revenue	41.90	2,040.92	303.86	-1,737.06	3,500.00
Expense	255.00	2,332.61	2,846.65	-514.04	4,000.00
Total Fund: 177 - SEIZED ASSETS (POLICE):	-213.10	-291.69	-2,542.79	-2,251.10	-500.00
Fund: 181 - #7 HUD LEAD GRANT					
Revenue	119,752.68	1,070,383.37	215,981.25	-854,402.12	1,834,943.00
Expense	80,263.07	1,070,328.07	416,722.72	653,605.35	1,834,943.00
Total Fund: 181 - #7 HUD LEAD GRANT:	39,489.61	55.30	-200,741.47	-200,796.77	0.00
Fund: 184 - VOUCHERS - 002, 003					
Revenue	134,257.02	844,917.36	917,549.22	72,631.86	1,448,431.00
Expense	133,652.96	844,871.86	893,954.25	-49,082.39	1,448,431.00
Total Fund: 184 - VOUCHERS - 002, 003:	604.06	45.50	23,594.97	23,549.47	0.00
Fund: 189 - #6 HUD LEAD GRANT/NOW STATE FUNDS ONLY					
Revenue	740.64	0.00	4,360.81	4,360.81	0.00
Total Fund: 189 - #6 HUD LEAD GRANT/NOW STATE FUNDS ONLY:	740.64	0.00	4,360.81	4,360.81	0.00
Fund: 200 - GO BONDS DEBT FUND					
Revenue	19,810.43	4,319,101.22	2,864,733.56	-1,454,367.66	7,404,174.00
Expense	0.00	4,478,842.55	991,795.30	3,487,047.25	7,678,016.00
Total Fund: 200 - GO BONDS DEBT FUND:	19,810.43	-159,741.33	1,872,938.26	2,032,679.59	-273,842.00
Fund: 300 - CIP COLLECTION FUND					
Revenue	6,113.85	415,446.99	405,659.96	-9,787.03	712,195.00
Expense	12,257.90	481,887.49	504,642.30	-22,754.81	826,093.00
Total Fund: 300 - CIP COLLECTION FUND:	-6,144.05	-66,440.50	-98,982.34	-32,541.84	-113,898.00
Fund: 311 - RISE STREET GRANTS					
Revenue	0.00	2,275,000.00	319,534.62	-1,955,465.38	3,900,000.00
Expense	0.00	2,858,333.31	63,831.35	2,794,501.96	4,900,000.00
Total Fund: 311 - RISE STREET GRANTS:	0.00	-583,333.31	255,703.27	839,036.58	-1,000,000.00
Fund: 312 - AIRPORT PROJECT FUND					
Revenue	0.00	291,666.62	2.08	-291,664.54	500,000.00
Expense	0.00	314,999.93	4,096.46	310,903.47	540,000.00
Total Fund: 312 - AIRPORT PROJECT FUND:	0.00	-23,333.31	-4,094.38	19,238.93	-40,000.00

Monthly Budget Report - Marshalltown

For Fiscal: 2024-2025 Period Ending: 01/31/2025

Account Typ...	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 340 - BIKE PATH PROJECT FUND					
Expense	0.00	955,231.55	8,132.67	947,098.88	1,637,540.00
Total Fund: 340 - BIKE PATH PROJECT FUND:	0.00	955,231.55	8,132.67	947,098.88	1,637,540.00
Fund: 341 - TREES FOREVER PROJECT					
Revenue	4,061.37	20,883.24	6,636.67	-14,246.57	35,800.00
Expense	0.00	23,333.31	13,459.47	9,873.84	40,000.00
Total Fund: 341 - TREES FOREVER PROJECT:	4,061.37	-2,450.07	-6,822.80	-4,372.73	-4,200.00
Fund: 350 - GO BONDS CAPITAL PROJECTS					
Revenue	45.85	116.62	269.94	153.32	200.00
Total Fund: 350 - GO BONDS CAPITAL PROJECTS:	45.85	116.62	269.94	153.32	200.00
Fund: 355 - Dangerous & Dilapidated (included GO bonds)					
Revenue	1,007.00	192,789.24	15,131.47	-177,657.77	330,500.00
Expense	10,857.83	109,548.11	15,326.83	94,221.28	187,800.00
Total Fund: 355 - Dangerous & Dilapidated (included GO bonds):	-9,850.83	83,241.13	-195.36	-83,436.49	142,700.00
Fund: 362 - 2020 GO BONDS					
Expense	0.00	5,104.75	0.00	5,104.75	8,751.00
Total Fund: 362 - 2020 GO BONDS:	0.00	5,104.75	0.00	5,104.75	8,751.00
Fund: 363 - 2021 GO BONDS					
Revenue	21,174.59	1,768,534.74	548,962.53	-1,219,572.21	3,031,774.00
Expense	44,463.45	3,942,332.17	2,996,837.16	945,495.01	6,758,284.00
Total Fund: 363 - 2021 GO BONDS:	-23,288.86	-2,173,797.43	-2,447,874.63	-274,077.20	-3,726,510.00
Fund: 364 - 2022 GO BONDS					
Revenue	42,300.90	1,802,499.86	426,982.78	-1,375,517.08	3,090,000.00
Expense	142,993.52	5,761,751.80	1,321,657.05	4,440,094.75	9,877,289.00
Total Fund: 364 - 2022 GO BONDS:	-100,692.62	-3,959,251.94	-894,674.27	3,064,577.67	-6,787,289.00
Fund: 365 - 2023 GO BONDS					
Revenue	46,989.58	58,333.31	302,410.01	244,076.70	100,000.00
Expense	0.00	2,216,377.73	17,500.00	2,198,877.73	3,799,505.00
Total Fund: 365 - 2023 GO BONDS:	46,989.58	-2,158,044.42	284,910.01	2,442,954.43	-3,699,505.00
Fund: 389 - AMERICAN RESCUE PLAN					
Expense	0.00	208,294.87	145,831.29	62,463.58	357,077.00
Total Fund: 389 - AMERICAN RESCUE PLAN:	0.00	208,294.87	145,831.29	62,463.58	357,077.00
Fund: 395 - ECONOMIC DEVELOPMENT PROJECT FUND					
Revenue	97,265.60	0.00	97,265.60	97,265.60	0.00
Total Fund: 395 - ECONOMIC DEVELOPMENT PROJECT FUND:	97,265.60	0.00	97,265.60	97,265.60	0.00
Fund: 610 - WATER POLLUTION CONTROL					
Revenue	369,533.92	5,130,416.06	2,665,913.56	-2,464,502.50	8,794,999.00
Expense	369,533.92	5,129,846.75	2,665,913.56	2,463,933.19	8,794,999.00

Monthly Budget Report - Marshalltown

For Fiscal: 2024-2025 Period Ending: 01/31/2025

Account Typ...	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Total Fund: 610 - WATER POLLUTION CONTROL:	0.00	569.31	0.00	-569.31	0.00
Fund: 611 - WPCP REVENUE					
Revenue	877,941.73	4,849,074.79	5,561,733.21	712,658.42	8,312,700.00
Expense	369,533.92	7,356,246.31	3,364,125.69	3,992,120.62	12,610,708.00
Total Fund: 611 - WPCP REVENUE:	508,407.81	-2,507,171.52	2,197,607.52	4,704,779.04	-4,298,008.00
Fund: 614 - WPCP CAPITAL IMPROVEMENT RSRV					
Revenue	5,500.24	14,583.31	32,381.41	17,798.10	25,000.00
Total Fund: 614 - WPCP CAPITAL IMPROVEMENT RSRV:	5,500.24	14,583.31	32,381.41	17,798.10	25,000.00
Fund: 615 - WPCP PLANT & IMPROVEMENTS					
Revenue	890,739.04	2,336,267.50	3,310,315.98	974,048.48	4,005,030.00
Expense	495,605.54	2,336,267.43	3,339,152.73	-1,002,885.30	4,005,030.00
Total Fund: 615 - WPCP PLANT & IMPROVEMENTS:	395,133.50	0.07	-28,836.75	-28,836.82	0.00
Fund: 616 - SANITARY SEWER REHAB PROJECT					
Revenue	0.00	87,500.00	101,942.77	14,442.77	150,000.00
Expense	0.00	87,500.00	245,251.72	-157,751.72	150,000.00
Total Fund: 616 - SANITARY SEWER REHAB PROJECT:	0.00	0.00	-143,308.95	-143,308.95	0.00
Fund: 617 - SANITARY SEWER NEW CONSTRUCTN					
Revenue	0.00	4,083.31	6,698.00	2,614.69	7,000.00
Total Fund: 617 - SANITARY SEWER NEW CONSTRUCTN:	0.00	4,083.31	6,698.00	2,614.69	7,000.00
Fund: 618 - WPCP INSURANCE RESERVE (WAS TORNADO)					
Revenue	932.71	0.00	103,535.29	103,535.29	0.00
Total Fund: 618 - WPCP INSURANCE RESERVE (WAS TORNADO):	932.71	0.00	103,535.29	103,535.29	0.00
Fund: 690 - TRANSIT OPERATING					
Revenue	43,248.70	979,474.16	523,427.92	-456,046.24	1,679,099.00
Expense	93,510.91	1,143,540.86	551,168.32	592,372.54	1,960,704.00
Total Fund: 690 - TRANSIT OPERATING:	-50,262.21	-164,066.70	-27,740.40	136,326.30	-281,605.00
Fund: 691 - TRANSIT INSURANCE RESERVE					
Revenue	118.09	0.00	695.25	695.25	0.00
Total Fund: 691 - TRANSIT INSURANCE RESERVE:	118.09	0.00	695.25	695.25	0.00
Fund: 740 - STORM SEWER UTILITY					
Revenue	142,983.80	818,620.81	955,546.29	136,925.48	1,403,350.00
Expense	62,242.04	867,408.50	597,580.43	269,828.07	1,487,231.00
Total Fund: 740 - STORM SEWER UTILITY:	80,741.76	-48,787.69	357,965.86	406,753.55	-83,881.00
Fund: 750 - COMPOSTING FACILITY					
Revenue	1,039.99	40,424.86	53,864.15	13,439.29	69,300.00
Expense	4,897.06	51,538.13	101,557.26	-50,019.13	88,362.00
Total Fund: 750 - COMPOSTING FACILITY:	-3,857.07	-11,113.27	-47,693.11	-36,579.84	-19,062.00

Monthly Budget Report - Marshalltown

For Fiscal: 2024-2025 Period Ending: 01/31/2025

Account Typ...	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 760 - P&R CONCESSIONS ENTERPRISE					
Revenue	0.00	28,000.00	33,208.44	5,208.44	48,000.00
Expense	0.00	26,570.95	44,577.56	-18,006.61	45,558.00
Total Fund: 760 - P&R CONCESSIONS ENTERPRISE:	0.00	1,429.05	-11,369.12	-12,798.17	2,442.00
Fund: 881 - OCCUPATIONAL INSURANCE ESCROW					
Revenue	20,348.76	0.00	107,548.42	107,548.42	0.00
Expense	2,172.33	0.00	16,850.36	-16,850.36	0.00
Total Fund: 881 - OCCUPATIONAL INSURANCE ESCROW:	18,176.43	0.00	90,698.06	90,698.06	0.00
Fund: 884 - GROUP HEALTH INSURANCE ESCROW					
Revenue	347,611.08	0.00	2,329,287.95	2,329,287.95	0.00
Expense	210,083.59	0.00	1,803,375.94	-1,803,375.94	0.00
Total Fund: 884 - GROUP HEALTH INSURANCE ESCROW:	137,527.49	0.00	525,912.01	525,912.01	0.00
Fund: 886 - WORKMAN'S COMP DEDUCTIBLE FUND					
Revenue	169.22	0.00	1,003.00	1,003.00	0.00
Expense	0.00	0.00	356.04	-356.04	0.00
Total Fund: 886 - WORKMAN'S COMP DEDUCTIBLE FUND:	169.22	0.00	646.96	646.96	0.00
Fund: 913 - 911 COMMISSION					
Revenue	118,943.91	0.00	912,413.99	912,413.99	0.00
Expense	180,798.37	0.00	986,259.31	-986,259.31	0.00
Total Fund: 913 - 911 COMMISSION:	-61,854.46	0.00	-73,845.32	-73,845.32	0.00
Report Total:	368,437.54	-13,618,439.03	3,448,248.05	17,066,687.08	-23,354,220.61

Fund Summary

Fund	January Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
001 - GENERAL FUND	-1,584,823.02	3,900.40	-996,709.62	-1,000,610.02	0.00
010 - CASH FLOW RESERVE FUND	14,916.73	197,779.75	87,818.78	-109,960.97	339,051.00
011 - INSURANCE DEDUCTIBLE RE	1,174.41	0.00	106,132.69	106,132.69	0.00
030 - CAPITAL RESERVE	0.00	75.95	0.00	-75.95	0.00
031 - CAPITAL RSRV-BLDG MAINT	1,152.09	-26,055.68	6,782.66	32,838.34	-44,667.00
032 - CIP LARGE VEHICLE/EQUIPM	0.00	59,495.87	0.00	-59,495.87	101,993.00
110 - ROAD USE TAX	325,334.40	247,607.99	1,288,136.77	1,040,528.78	424,466.00
111 - ROAD USE TAX INSURANCE	351.27	0.00	26,579.09	26,579.09	0.00
112 - EMPLOYEE BENEFITS FUND	29,759.56	-423,434.69	108,370.99	531,805.68	-725,888.00
117 - POLICE/FIRE RETIREMENT	8,910.57	40,946.29	107,539.29	66,593.00	70,194.00
119 - EMERGENCY FUND	0.00	0.00	2.04	2.04	0.00
121 - LOCAL OPTION SALES TAX	430,139.12	-921,408.11	781,993.29	1,703,401.40	-1,579,559.00
125 - TAX INCREMENT FINANCING	17,955.42	-28,040.32	299,682.18	327,722.50	-48,069.00
126 - TIF-LMI	0.00	5,507.18	0.00	-5,507.18	9,441.00
130 - CITY TORT LIABILITY	-1,200.09	583.31	19,139.10	18,555.79	1,000.00
132 - GRANTS-STATE/LOCAL AGE	20,659.00	258,877.15	-200,360.37	-459,237.52	444,117.39
133 - UNDESIGNATED FEDERAL G	-73,478.47	4,958.45	87,723.10	82,764.65	8,500.00
140 - PARK & REC DONATION FUI	32,945.97	-1,691.62	174,203.11	175,894.73	-2,900.00
141 - MTOWN TENNIS ASSOC	14.18	11.62	83.50	71.88	20.00
142 - SOFTBALL ASSOCIATION FU	23,721.45	16.73	-1,415.65	-1,432.38	0.00
144 - LIVE HEALTHY IOWA	45.96	0.42	270.55	270.13	0.00
145 - TORNADO GENERAL	0.00	-76,920.62	-247,863.02	-170,942.40	-131,864.00
150 - LOCAL PD GRANTS	-1,765.34	0.00	-3,028.18	-3,028.18	0.00
151 - DEPT OF JUSTICE GRANTS	2,447.46	-1.82	-7,370.05	-7,368.23	0.00
152 - POLICE UNDESIGNATED GR.	5,503.73	19.88	5,756.63	5,736.75	0.00
153 - POLICE DEPT DONATION FL	1,752.95	-16,123.10	-1,369.48	14,753.62	-27,650.00
154 - AUTOMATED TRAFFIC ENFC	15,384.93	0.00	85,071.36	85,071.36	0.00
156 - FIRE DEPT DONATION FUNI	347.98	-16,916.69	-5,539.87	11,376.82	-29,000.00
160 - ECONOMIC DEVELOPMENT	269.77	583.31	1,588.20	1,004.89	1,000.00
161 - SURETY DEPOSITS/SUBDIVII	56.28	107.87	331.36	223.49	185.00
170 - LIBRARY DONATION FUND	-2,689.96	-5,987.80	12,202.03	18,189.83	-10,265.00
177 - SEIZED ASSETS (POLICE)	-213.10	-291.69	-2,542.79	-2,251.10	-500.00
181 - #7 HUD LEAD GRANT	39,489.61	55.30	-200,741.47	-200,796.77	0.00
184 - VOUCHERS - 002, 003	604.06	45.50	23,594.97	23,549.47	0.00
189 - #6 HUD LEAD GRANT/NOW	740.64	0.00	4,360.81	4,360.81	0.00
200 - GO BONDS DEBT FUND	19,810.43	-159,741.33	1,872,938.26	2,032,679.59	-273,842.00
300 - CIP COLLECTION FUND	-6,144.05	-66,440.50	-98,982.34	-32,541.84	-113,898.00
311 - RISE STREET GRANTS	0.00	-583,333.31	255,703.27	839,036.58	-1,000,000.00
312 - AIRPORT PROJECT FUND	0.00	-23,333.31	-4,094.38	19,238.93	-40,000.00
340 - BIKE PATH PROJECT FUND	0.00	-955,231.55	-8,132.67	947,098.88	-1,637,540.00

Monthly Budget Report - Marshalltown

For Fiscal: 2024-2025 Period Ending: 01/31/2025

341 - TREES FOREVER PROJECT	4,061.37	-2,450.07	-6,822.80	-4,372.73	-4,200.00
350 - GO BONDS CAPITAL PROJEC	45.85	116.62	269.94	153.32	200.00
355 - Dangerous & Dilapidated (ir	-9,850.83	83,241.13	-195.36	-83,436.49	142,700.00
362 - 2020 GO BONDS	0.00	-5,104.75	0.00	5,104.75	-8,751.00
363 - 2021 GO BONDS	-23,288.86	-2,173,797.43	-2,447,874.63	-274,077.20	-3,726,510.00
364 - 2022 GO BONDS	-100,692.62	-3,959,251.94	-894,674.27	3,064,577.67	-6,787,289.00
365 - 2023 GO BONDS	46,989.58	-2,158,044.42	284,910.01	2,442,954.43	-3,699,505.00
389 - AMERICAN RESCUE PLAN	0.00	-208,294.87	-145,831.29	62,463.58	-357,077.00
395 - ECONOMIC DEVELOPMENT	97,265.60	0.00	97,265.60	97,265.60	0.00
610 - WATER POLLUTION CONTRI	0.00	569.31	0.00	-569.31	0.00
611 - WPCP REVENUE	508,407.81	-2,507,171.52	2,197,607.52	4,704,779.04	-4,298,008.00
614 - WPCP CAPITAL IMPROVEMI	5,500.24	14,583.31	32,381.41	17,798.10	25,000.00
615 - WPCP PLANT & IMPROVEM	395,133.50	0.07	-28,836.75	-28,836.82	0.00
616 - SANITARY SEWER REHAB PF	0.00	0.00	-143,308.95	-143,308.95	0.00
617 - SANITARY SEWER NEW COM	0.00	4,083.31	6,698.00	2,614.69	7,000.00
618 - WPCP INSURANCE RESERVE	932.71	0.00	103,535.29	103,535.29	0.00
690 - TRANSIT OPERATING	-50,262.21	-164,066.70	-27,740.40	136,326.30	-281,605.00
691 - TRANSIT INSURANCE RESER	118.09	0.00	695.25	695.25	0.00
740 - STORM SEWER UTILITY	80,741.76	-48,787.69	357,965.86	406,753.55	-83,881.00
750 - COMPOSTING FACILITY	-3,857.07	-11,113.27	-47,693.11	-36,579.84	-19,062.00
760 - P&R CONCESSIONS ENTERP	0.00	1,429.05	-11,369.12	-12,798.17	2,442.00
881 - OCCUPATIONAL INSURANCI	18,176.43	0.00	90,698.06	90,698.06	0.00
884 - GROUP HEALTH INSURANCI	137,527.49	0.00	525,912.01	525,912.01	0.00
886 - WORKMAN'S COMP DEDUC	169.22	0.00	646.96	646.96	0.00
913 - 911 COMMISSION	-61,854.46	0.00	-73,845.32	-73,845.32	0.00
Report Total:	368,437.54	-13,618,439.03	3,448,248.05	17,066,687.08	-23,354,220.61

**RESOLUTION APPROVING APPLICATIONS FOR TAX ABATEMENT WITHIN
APPROVED URBAN REVITALIZATION AREAS OF THE CITY OF
MARSHALLTOWN, IOWA**

WHEREAS, the City of Marshalltown has heretofore adopted Ordinances designating certain Urban Revitalization Areas pursuant to provisions of Iowa Code 404; and

WHEREAS, the City of Marshalltown has also adopted Ordinance 15093 which allows Industrial Property Tax Exemption for qualified improvements pursuant to Iowa Code 427B; and

WHEREAS, the Marshalltown City Clerk has received certain applications requesting tax abatement benefits pursuant to the provisions of Iowa Code 404.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA:

Section 1. Attached hereto are applications requesting tax abatement pursuant to previously approved and established Urban Revitalization Areas.

Section 2. The attached applications and requests for tax abatement are hereby approved and ratified.

Section 3. The City Clerk or City Administrator are hereby authorized and directed to forward these applications, along with a copy of this Resolution, to the County Assessor and furnish all things requested by them for a review and approval of these applications.

Passed this 24th day of February 2025, and signed this ____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

— I O W A —

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor and City Council
FROM: Alicia Hunter, City Clerk
DATE: February 19, 2025
RE: Urban Revitalization Tax Abatement Applications

Strategic Plan Objective:

Recommendation: Staff recommend approving the applications.

Budget Impact: Abatement of taxes for the requested schedules.

Description/Background: The City of Marshalltown has adopted an ordinance designating certain Urban Revitalization Areas pursuant to the provisions of Iowa Code 404, allowing tax abatement for new housing or the rehabilitation of existing housing. Qualified residential real estate may be eligible to receive an exemption from property taxes, except for property tax levies imposed by a school district. The applicant may choose 100% exemption for three years, or a sliding tax exemption for either five- or ten-years.

In order to apply for commercial tax abatement, the City and the Property Owner must enter into a minimum assessment agreement establishing the minimum taxable value for the property and the improvements to qualify for exemption. The council approved these agreements on 2/10/25 with Aust Incorporated for 1101 Lincoln Way and Timber Ridge Senior LP for 403 East Church Street.

Staff recommend the approval residential and commercial tax abatement applications.

Residential	Commercial
830 W Merle Hibbs Blvd	1101 Lincoln Way
832 W Merle Hibbs Blvd	403 East Church Street

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



CITY OF MARSHALLTOWN
APPLICATION FOR RESIDENTIAL TAX ABATEMENT



Pursuant to the amended and restated Marshalltown Urban Revitalization Plan Adopted by the City Council of the City of Marshalltown, Iowa for tax exemption of the actual value added by eligible improvements constructed on *qualified* properties located in the Marshalltown Urban Revitalization Area. Exemption is not applicable to property tax levies imposed by a school district for applications submitted after July 1, 2024, as and to the extent required by Iowa Code Section 404.3D. The improvements made to the property are believed to have increased its actual value by at least ten (10) percent and have been made in compliance with all applicable laws, codes and ordinances. There is no dollar limit for qualifying property improvements.

First Year Application for Completed Improvements:

Application must be filed with the City by February 1st of the assessment year for which the exemption is first claimed, not later than the year in which the improvements are first assessed for taxation or the following two assessment years. The filing fee is \$50 per residential unit.

Name of Property Owner: <i>Kevin J. Holubar</i>		Phone Number: <i>641-752-1686</i>	
Current Mailing Address: <i>830 W. Merle Hibbs Blvd Marshalltown, IA 50158</i>			
Address of Property for Tax Abatement: <i>830 W. Merle Hibbs Blvd</i>		Building Permit Number: <i>BUR-009608-2024</i>	Date of Building Permit: <i>April 2024</i>
Parcel Identification Number (PIN): <i>8318-10-434-004</i>		New Structure? ☒ Yes ☐ No	Remodel? ☐ Yes ☒ No
Property Legal Description: <i>Merle Hibbs West Sub Lot 5</i>			
Describe the Improvements to the Existing Structure: <i>N/A new build</i>			
Estimated or Actual Date of Completion: <i>12-18-2024</i>		Estimated or Actual Cost of Improvement: <i>\$278,611</i>	
What was the property used for on the effective date of the ordinance, June 11, 2024:			
Number of Residential Units: <i>1</i>		If Rental Property, Number of Tenants: <i>N/A</i>	

Select One Abatement Schedule:

- ☒ Three-Year Schedule Over three years: 100%, 100%, 100%
- ☐ Five-Year Schedule Over five years: 100%, 80%, 60%, 40%, 20%
- ☐ Ten-Year Schedule Over ten years: 80%, 70%, 60%, 50%, 40%, 40%, 30%, 30%, 20%, 20%

The application is due before February 1st of each year at the office of the City Clerk, 24 North Center Street, Marshalltown, IA 50158. The \$50 filing fee per residential unit is payable to the City of Marshalltown at the City Clerk's office upon filing this application. If approved by the City Council of the City of Marshalltown, Iowa, it will be filed with the Marshall County Assessor's Office on or before March 1st.

Tax Abatement may not be filed if you have applied for the Make Marshalltown Home New Home \$10,000 Grant incentive through the Marshalltown Area Chamber of Commerce. For more information about this program in lieu of tax abatement please visit <https://www.marshalltown.org/make-marshalltown-home/>.

Authorized Signature: <i>Kevin J. Holubar</i>	Title (Owner or Representative): <i>OWNER</i>	Date: <i>1/16/2025</i>
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CITY OF MARSHALLTOWN

APPLICATION FOR RESIDENTIAL TAX ABATEMENT



Pursuant to the amended and restated Marshalltown Urban Revitalization Plan Adopted by the City Council of the City of Marshalltown, Iowa for tax exemption of the actual value added by eligible improvements constructed on *qualified* properties located in the Marshalltown Urban Revitalization Area. Exemption is not applicable to property tax levies imposed by a school district for applications submitted after July 1, 2024, as and to the extent required by Iowa Code Section 404.3D. The improvements made to the property are believed to have increased its actual value by at least ten (10) percent and have been made in compliance with all applicable laws, codes and ordinances. There is no dollar limit for qualifying property improvements.

First Year Application for Completed Improvements:

Application must be filed with the City by February 1st of the assessment year for which the exemption is first claimed, not later than the year in which the improvements are first assessed for taxation or the following two assessment years. The filing fee is \$50 per residential unit.

Name of Property Owner: Roland & Karol Ackerman		Phone Number: 319-269-3133	
Current Mailing Address: 832 W Merle Hibbs Blvd, Marshalltown, IA 50158			
Address of Property for Tax Abatement: 832 W Merle Hibbs Blvd, Marshalltown, IA 50158		Building Permit Number: BLDR-009608-2024	Date of Building Permit: Apr. 2024
Parcel Identification Number (PIN): 8318-10-434-003		New Structure? ☒ Yes ☐ No	Remodel? ☐ Yes ☒ No
Property Legal Description: MERLE HIBBS WEST SUB LOT 6			
Describe the Improvements to the Existing Structure: New build			
Estimated or Actual Date of Completion: Jan 2025		Estimated or Actual Cost of Improvement: \$339,900	
What was the property used for on the effective date of the ordinance, June 11, 2024: Residential housing			
Number of Residential Units: 1		If Rental Property, Number of Tenants:	

Select One Abatement Schedule:

- ☒ Three-Year Schedule Over three years: 100%, 100%, 100%
- ☐ Five-Year Schedule Over five years: 100%, 80%, 60%, 40%, 20%
- ☐ Ten-Year Schedule Over ten years: 80%, 70%, 60%, 50%, 40%, 40%, 30%, 30%, 20%, 20%

The application is due before February 1st of each year at the office of the City Clerk, 24 North Center Street, Marshalltown, IA 50158. The \$50 filing fee per residential unit is payable to the City of Marshalltown at the City Clerk's office upon filing this application. If approved by the City Council of the City of Marshalltown, Iowa, it will be filed with the Marshall County Assessor's Office on or before March 1st.

Tax Abatement may not be filed if you have applied for the Make Marshalltown Home New Home \$10,000 Grant incentive through the Marshalltown Area Chamber of Commerce. For more information about this program in lieu of tax abatement please visit <https://www.marshalltown.org/make-marshalltown-home/>.

Authorized Signature: 	Title (Owner or Representative): Owner	Date: 01/31/25
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CITY OF MARSHALLTOWN

APPLICATION FOR COMMERCIAL TAX ABATEMENT



Pursuant to the amended and restated Marshalltown Urban Revitalization Plan Adopted by the City Council of the City of Marshalltown, Iowa for tax exemption of the actual value added by eligible improvements constructed on *qualified* properties located in the Marshalltown Urban Revitalization Area. Exemption is not applicable to property tax levies imposed by a school district for applications submitted after July 1, 2024, as and to the extent required by Iowa Code Section 404.3D. The improvements made to the property are believed to have increased its actual value by at least ten (10) percent and have been made in compliance with all applicable laws, codes and ordinances. There is no dollar limit for qualifying property improvements.

Written Assessment Agreement:

A written assessment agreement is required to qualify for exemption on property assessed as commercial. This must be approved by the County Assessor prior to filing the first-year application for completed improvements.

Name of Property Owner: Aust Incorporated	Phone Number: 515-720-7101	
Current Mailing Address: 1201 Keosauqua Way, Suite 101, Des Moines, IA 50309	Email: austincorporated@yahoo.com	
Address of Property for Tax Abatement: 1101 W Lincoln Way, Marshalltown, IA 50158	Building Permit Number: 7982,7981,7983,7980,8153	Date of Building Permit: 09/23/22 & 10/22/22
Parcel Identification Number (PIN): 8418-34-256-005	New Structure? ☒ Yes ☐ No	Remodel? ☐ Yes ☒ No
Property Legal Description: LOT 2 EX S 183' W 183' SW NE & EX E 150' OF S 183' OF LOT 2 & EX PARCEL A & EX S 33' THEREOF		
Describe the Improvements to the Existing Structure: 5 new self storage buildings		
Estimated or Actual Date of Completion: 07/01/23	Estimated or Actual Cost of Improvement: \$1,035,850	
What was the property used for on the effective date of the ordinance, June 11, 2024? Yes		
Authorized Signature: 	Title (owner or signatory): President	Date: 01/23/25

Official Use Only: County Assessor Review

Prior Building/Improvements Assessed Value: _____
Assessed Value with New Improvements: _____
Percentage Increase in Assessed Value (%): _____ ☐ Eligible ☐ Not Eligible
Assessor's Signature: _____ Date: _____

First Year Application for Completed Improvements:

Once the Written Assessment is approved the application will be filed with the City Council. The abatement schedule is 100% over three years. The application must be filed with the City by February 1st of the assessment year for which the exemption is first claimed, not later than the year in which the improvements are first assessed for taxation or the following two assessment years. The \$50 filing fee is payable to the City of Marshalltown upon filing this application. If approved by the City Council, it will be filed with the Marshall County Assessor's Office on or before March 1st.

Official Use Only: City Council Review

Written Assessment Approved by Resolution: _____ Adopted On: _____
First Year Application Approved by Resolution: _____ Adopted On: _____
☐ Application Denied – Reason: _____



CITY OF MARSHALLTOWN
APPLICATION FOR COMMERCIAL TAX ABATEMENT



Pursuant to the amended and restated Marshalltown Urban Revitalization Plan Adopted by the City Council of the City of Marshalltown, Iowa for tax exemption of the actual value added by eligible improvements constructed on *qualified* properties located in the Marshalltown Urban Revitalization Area. Exemption is not applicable to property tax levies imposed by a school district for applications submitted after July 1, 2024, as and to the extent required by Iowa Code Section 404.3D. The improvements made to the property are believed to have increased its actual value by at least ten (10) percent and have been made in compliance with all applicable laws, codes and ordinances. There is no dollar limit for qualifying property improvements.

Written Assessment Agreement:

A written assessment agreement is required to qualify for exemption on property assessed as commercial. This must be approved by the County Assessor prior to filing the first-year application for completed improvements.

Name of Property Owner: Timber Ridge Senior LP (dba) Clock Tower Senior LP		Phone Number: 515-490-7000	
Current Mailing Address: 3721 SW 61st Street, Ste A, Des Moines, IA 50321		Email: jbconlin@conlinproperteis.com	
Address of Property for Tax Abatement: 403 E Church St, Marshalltown, IA 50158		Building Permit Number: BLDR-008437-2023	Date of Building Permit: 4-25-23
Parcel Identification Number (PIN): 8418-35-229-016		New Structure? ☒ Yes ☐ No	Remodel? ☐ Yes ☒ No
Property Legal Description: ANDREWS ADD TO MARSHALL W 1/2 LOT 2 & LOTS 3-6 & N 180' OF VAC N-S ALLEY ALL IN BLK 5			
Describe the Improvements to the Existing Structure: New construction of 42 LIHTC senior affordable apartment units. The parcel was formerly a parking lot.			
Estimated or Actual Date of Completion: 9-30-24		Estimated or Actual Cost of Improvement: \$8,320,000	
What was the property used for on the effective date of the ordinance, June 11, 2024? Multifamily LIHTC Sec 42 senior housing			
Authorized Signature: 		Title (owner or signatory): Manger	Date: 1/23/25

Digitally signed by JB Conlin
DN: cn=JB Conlin, o=Conlin Properties, Inc., ou,
email=jbconlin@conlinproperties.com, c=US
Date: 2025.01.23 10:50:58 -06'00'

Official Use Only: County Assessor Review

Prior Building/Improvements Assessed Value: _____
Assessed Value with New Improvements: _____
Percentage Increase in Assessed Value (%): _____ ☐ Eligible ☐ Not Eligible
Assessor's Signature: _____ Date: _____

First Year Application for Completed Improvements:

Once the Written Assessment is approved the application will be filed with the City Council. The abatement schedule is 100% over three years. The application must be filed with the City by February 1st of the assessment year for which the exemption is first claimed, not later than the year in which the improvements are first assessed for taxation or the following two assessment years. The \$50 filing fee is payable to the City of Marshalltown upon filing this application. If approved by the City Council, it will be filed with the Marshall County Assessor's Office on or before March 1st.

Official Use Only: City Council Review

Written Assessment Approved by Resolution: _____ Adopted On: _____
First Year Application Approved by Resolution: _____ Adopted On: _____
☐ Application Denied – Reason: _____



**RESOLUTION APPROVING 28E AGREEMENT FOR MUTUAL ASSISTANCE FOR
POLK COUNTY AREA FIRE/RESCUE SERVICES**

WHEREAS, the City of Marshalltown (hereinafter referred to as the “City”), State of Iowa, is a political subdivision organized and existing under the law and the Constitution of the State of Iowa (the “State”); and

WHEREAS, the City desires to enter into this 28E Agreement (“Agreement”), the purpose of which is to provide for the Emergency Services of one entity to the other in such emergency or needed situations requiring additional, special personnel, and/or equipment with Polk County.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA,

Section 1. That the City Council approves the 28E Agreement for Mutual Assistance for Polk County Area Fire/Rescue Services; and the Mayor and Clerk are hereby authorized and directed to execute said agreement on behalf of the City.

Passed this 24th day of February 2025 and signed this _____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor and City Council
FROM: Christopher Cross, Fire Chief
DATE: 2/13/2025
RE: Renewal of Polk Co Area Fire/Rescue Services 28E Agreement

Strategic Plan Objective: N/A

Recommendation:

The Fire Chief recommends council approval of continuing the 28E agreement with Polk County for Fire and EMS mutual aid.

Budget Impact:

The budget impact, should Marshalltown assets be deployed to Polk County, would be overtime costs to backfill the department in the absence of the scheduled crew. Reimbursement for personnel (including backfill), equipment, and supplies can be billed to the requesting entity if the operational period is greater than 12 hours. Additionally, supplies, apparatus, and manpower costs can be billed to the spiller of a hazardous materials incident, as described on pages 7 and 8 of the agreement.

Description/Background:

The purpose of this agreement is to provide for Mutual Aid in case of an Emergency within the jurisdiction of the Parties to this Agreement arising in Polk County and/or the adjoining counties of Boone, Dallas, Jasper, Madison, Marion, Marshall, Story and Warren. This agreement was most recently authorized by council in late 2016 and executed in early 2017. The agreement describes the list of mutual aid partners are available for service in the event of a large incident overwhelming the local resources. The agreement also describes command authority responsibilities and the methods and parameters for reimbursement if mutual aid assets are committed for greater than 12 hours.

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson





28E Agreement

Item 1. The full legal name, organization type and county of each participant to this agreement are:

	Full Legal Name	Organization Type	*County
Party 1	City of Altoona	City	Polk
Party 2	City of Ankeny	City	Polk
Party 3	City of Bondurant	City	Polk
Party 4	Camp Township	Township	Polk
Party 5	City of Carlisle	City	Warren
Party 6	City of Bussey	Marion	City
Party 7	Clay Township	Marion	Township
Party 8	City of Clive	Polk	City
Party 9	City of Colfax	Jasper	City
Party 10	Delaware Township	Polk	Township
Party 11	City of Des Moines	Polk	City
Party 12	Des Moines Airport Authority	Polk	Reg or District
Party 13	City of Elkhart	Polk	City
Party 14	City of Granger	Dallas	City
Party 15	City of Grimes	Polk	City
Party 16	City of Harvey	Marion	City
Party 17	City of Indianola	Warren	City
Party 18	City of Johnston	Polk	City
Party 19	City of Knoxville	Marion	City
Party 20	Lake Prairie Fire Service	Marion	Township
Party 21	City of Marshalltown	Marshall	City
Party 22	City of Maxwell	Story	City
Party 23	City of Mingo	Jasper	City
Party 24	City of Mitchellville	Polk	City

Party 25	City of Nevada	Story	City
Party 26	City of Newton	Jasper	City
Party 27	Northern Warren Fire & Emergency Response Agency	Warren	Reg or District
Party 28	City of Norwalk	Warren	City
Party 29	City of Pleasant Hill	Polk	City
Party 30	City of Polk City	Polk	City
Party 31	Saylor Township	Polk	Township
Party 32	City of Urbandale	Polk	City
Party 33	City of Waukee	Dallas	City
Party 34	City of West Des Moines	Polk	City
Party 35	City of Windsor Heights	Polk	City

Item 2. The type of Public Service included in this agreement is: 210 Fire Response
(Enter only one Service Code and Description) Code Number Service Description

Item 3. The purpose of this agreement is: *(please be specific)*

To provide for Mutual Aid in case of an Emergency within the jurisdiction of the Parties to this Agreement arising in Polk County and/or the adjoining counties of Boone, Dallas, Jasper, Madison, Marion, Marshall, Story and Warren.

Item 4. The duration of this agreement is: (check one) Agreement Expires _____ ☒ Indefinite Duration
[mm/dd/yyyy]

Item 5. Does this agreement amend or renew an existing agreement? *(check one)*

☐ **NO**

☒ **YES** Filing # of the agreement: M508206

(Use the filing number of the most recent version filed for this agreement)

The filing number of the agreement may be found by searching the 28E database at: <http://sos.iowa.gov/28e>.

Item 6. Attach two copies of the agreement to this form if not filing online.

Item 7. The primary contact for further information regarding this agreement is: *(optional)*

LAST Name _____ FIRST Name _____

Title _____ Department _____

Email _____ Phone _____

28E AGREEMENT FOR MUTUAL ASSISTANCE

for Polk County Area Fire/Rescue Services

WHEREAS, the undersigned entities (“Party” or collectively “Parties”) provide fire/rescue services and/or emergency medical services (“Emergency Services”) in Polk County and/or the adjoining counties of Boone County, Dallas County, Jasper County, Madison County, Marion County, Marshall County, Story County and Warren County (“adjoining counties”); and

WHEREAS, there has been a long standing Mutual Aid Agreement among Polk County fire/rescue and emergency medical services and/or other entities to provide mutual aid in Polk County and adjoining counties in a time of need;

WHEREAS, the current Mutual Aid Agreement is entitled 28E Agreement for Mutual Assistance for Polk County Fire/Rescue Services and is filed with the Iowa Secretary of State at 10:51 a.m. on June 24, 2015, numbered M508206 (“2015 Agreement”); and

WHEREAS, the Parties have a desire to assist each other in time of need; and

WHEREAS, the Parties each maintain adequate Emergency Services equipment and personnel to respond to the normal emergencies occurring within their respective jurisdictions; and

WHEREAS, situations may arise in regard to emergencies or circumstances which exhaust available personnel and equipment, or require additional or specialty personnel or additional and/or special equipment that the responsible jurisdiction may not have available at any given time; and

WHEREAS, to combat such emergency situations, it is desirable for the Parties to render needed Emergency Services upon a reciprocal basis; and

WHEREAS, the governing bodies of each party are desirous of entering into this 28E Agreement (“Agreement”), the purpose of which is to provide for the Emergency Services of one entity to the other in such emergency or needed situations requiring additional, special personnel, and/or equipment.

NOW, THEREFORE, BE IT AGREED AS FOLLOWS:

I. Incorporation of Recitals

The foregoing Recitals are incorporated herein as if fully set forth in this paragraph.

II. Definitions

- A. Mutual Aid/Automatic Aid. The assistance of Emergency Services personnel and equipment provided by one Party (“Providing Entity”) and requested by the other Party (“Requesting Entity”) to this Agreement. Automatic Aid is considered a subset of Mutual Aid, and both are interchangeable within this document.
- B. Incident Commander. The person who, by virtue of his/her position with the Requesting Entity, is responsible for the overall command and direction of the Emergency response activities.
- C. Emergency. Any situation where a Requesting Entity, due to lack of personnel or training, special equipment needs or magnitude of event, and based upon actual circumstances, concludes that assistance is needed from a Providing Entity(s) to protect life, stabilize the incident, and/or protect property within its jurisdiction.

III. Purpose

This Agreement is made pursuant to Chapter 28E, Code of Iowa. The purpose of this Agreement is to provide for Mutual Aid in case of an Emergency arising within the jurisdiction of the Parties to this Agreement.

IV. Request for Assistance

All requests for Mutual Aid in an Emergency shall be made by an Emergency Services director, Fire Chief or designee of the Requesting Entity. Additionally, requests for assistance can also be filled using pre-determined response tables utilizing Computer-Aided Dispatch (CAD) created by the Requesting Entity and approved the Providing Entity. Such requests shall state the exact nature of the Emergency and shall include the amount and type of equipment and the number and skills of personnel required, and shall specify the location where the personnel and equipment are needed. The final decision of type and amount of equipment and number of personnel to be provided by the Providing Entity to the Requesting Entity shall be at the sole discretion of the Providing Entity. Further, the Providing Entity shall be held harmless by the Requesting Entity from liability in connection with its final decision on type and amount of equipment and number of personnel to be provided to the Requesting Entity.

V. Authority over Joint Operations

The Incident Commander of the Requesting Entity shall retain overall control of all Emergency response activities. The ranking supervisor of the Providing Entity shall remain in command of his/her personnel and equipment subject, however, to the direction and control of the Incident Commander. By previous agreement, Incident Command can be initiated or assumed by a ranking supervisor from the Providing Entity for operational control, and incident safety purposes. It is understood that the purpose of this section is to maintain order for the emergency response and shall not be construed to establish an employer/employee relationship.

VI. Liability

Employees or volunteers of either Party acting pursuant to this Agreement shall be considered as acting under the lawful orders and instructions pertaining to their employment or volunteer status with such Party. Under no circumstances are employee or volunteers of one party to be considered employees or volunteers of the other Party.

Each Party waives all claims against the other for compensation for any property loss or damage and/or personal injury or death to its personnel as consequence of the performance of this Agreement. Each Party shall bear the liability and/or costs of damage to its equipment and facilities, and the compensation of its employees or volunteers, including injury or death of its personnel, occurring as a consequence of the performance of this Agreement, whether the damages, costs, injury or death occurs at an Emergency in the Party's own jurisdiction or in the jurisdiction of the other Party. Nothing in this agreement is intended nor does it waive any right to seek federal or other assistance provided for disaster relief.

Except as provided herein, each Party shall be responsible for the acts or omissions of its own employees, and shall indemnify, defend and hold harmless the Other Party, its officers, agents and employees from and against any and all suits, actions, debts, damages, costs, charges and expenses, including court costs and attorney's fees arising from loss of or damage to private property, and/or the death of or injury to private persons, arising from services of response rendered pursuant to this Agreement.

Provided, however, the Requesting Entity shall indemnify, defend and hold harmless the Providing Entity where any suits, actions, debts, damages, costs, charges or expenses arise from execution of a specific command or order pursuant to paragraph V of this Agreement.

Nothing in this Agreement shall prevent or limit either Party to this Agreement from recovering or attempting to recover costs of services rendered to a third party where such recovery of costs is provided for by law.

The Parties to this Agreement do not waive any defenses, immunities or other limitations applicable to a respective party and nothing herein shall be so construed. Each Party to this Agreement reserves the right to fully defend all claims arising from loss of or damage to private property and/or death of or injury to private persons who are not

parties to this Agreement including, but not limited to asserting defenses of immunities available under applicable law.

This article shall survive the termination of this Agreement where necessary to protect each Party to this Agreement.

VII. Compensation

- A. **Emergency Services.** For Emergency Services, no Party shall be required to reimburse any other Party for the cost of providing the services set forth in this Agreement, unless the incident lasts twelve hours or longer. If an incident lasts twelve hours or longer, the Providing Entity may seek compensation from the Requesting Entity for the cost of providing the services set forth in this Agreement. All services are billable if the incident lasts a minimum of twelve consecutive hours.

Services include, but are not limited to:

- a. Personnel (including backfill personnel)
- b. Equipment (at rates defined by FEMA)
- c. Supplies (actual cost incurred, including shipping of replacement supplies)
Documentation is required in the form of an incident report which clearly lists personnel, equipment and supplies used. Supply usage also requires an actual invoice copy.

- B. **Emergency Medical Services.** The Party transporting a patient from an emergency location to a medical facility will be responsible for billing the patient for services rendered.

If the Providing Entity provides supplemental services or a higher level of medical services than the Requesting Entity, such as paramedic services, the Requesting Entity may bill the patient for the supplemental services pursuant to accepted billing standards. In the event the Requesting Entity does not charge for ambulance services, the Providing Entity will bill the patient for services rendered and retain one hundred percent (100%) of fees collected.

- C. **Hazardous Materials Services.** The Providing Entity may bill the responsible person (as defined by Iowa Administrative Code Sections 133.2 and 133.3) at a hazardous substance or condition incident (as defined in Iowa Administrative Code Section 133.1(2)) to reclaim costs associated with responding to the incident.

VIII. Termination

This Agreement may be terminated with respect to that Party for any reason by any Party by giving written notice, by certified mail to the President of the Polk County Fire Chief's Association. This Agreement shall thereafter terminate, with respect to that Party only, sixty (60) days from the date of receipt of termination notice. Upon termination, said terminating Party shall have no further responsibility or obligation or benefits from

the other Parties to the Agreement, under this Agreement, except as provided herein.

IX. Effective Date

This Agreement shall be in full force and effect at 12:01 a.m., January 1, 2025, by and between the Parties who have obtained approval hereof by their respective governing bodies. Prior to January 1, 2025, the President of the Polk County Fire Chief's Association shall have filed this Agreement with the Iowa Secretary of State as required by Iowa Code section 28E.9. This Agreement shall remain in full force and effect for an indefinite period of time from the effective date hereof until terminated as provided in paragraph VII.

X. Prior Mutual Assistance Agreements

This Agreement supersedes the 2017 Agreement in full.

XI. Amendments

This Agreement represents the entire Agreement of the Parties. Any amendments must be in writing, approved by the governing body of all Parties, and executed by the authorized representatives of all Parties. Any and all amendments must comply with the provisions of Iowa Code section 28E.8. Any and all such requirements shall be done by the then presiding President of the Polk County Fire Chief's Association or President's designee.

XII. Validity

In the event any part or paragraph of this Agreement is declared void as being contrary to Iowa law, the remaining portions of this Agreement that are valid shall continue in full force and effect.

XIII. No Separate Entity Created -- Administration

It is the Intent of the Parties not to create a separate legal entity or administrative agency under this Agreement. The then presiding President of the Polk County Fire Chief's Association shall serve as Administrator of this undertaking.

XIV. No Real or Personal Property

No real or personal property will be acquired, held or disposed of during this undertaking as no separate entity has been created.

XV. Applicable Law

This Agreement shall be governed by and construed in accordance with the laws of the State of Iowa (excluding conflicts of laws rules), and applicable federal law.

XVI. Counterparts

This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all such counterparts shall together constitute but one and the same instrument.



*Paul
D. Pate
Secretary
of State
State of
Iowa*

28E Agreement

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	Full Legal Name	Organization Type	*County
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Party 5	City of Carlisle	City	Warren
Party 6	City of Bussey	Marion	City
Party 7	Clay Township	Marion	Township
Party 8	City of Clive	Polk	City
Party 9	City of Colfax	Jasper	City
Party 10	Delaware Township	Polk	Township
Party 11	City of Des Moines	Polk	City
Party 12	Des Moines Airport Authority	Polk	Reg or District
Party 13	City of Elkhart	Polk	City
Party 14	City of Granger	Dallas	City
Party 15	City of Grimes	Polk	City
Party 16	City of Harvey	Marion	City
Party 17	City of Indianola	Warren	City
Party 18	City of Johnston	Polk	City
Party 19	City of Knoxville	Marion	City
Party 20	Lake Prairie Fire Service	Marion	Township
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Party 22	City of Maxwell	Story	City
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28E AGREEMENT FOR MUTUAL ASSISTANCE

for Polk County Area Fire/Rescue Services

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WHEREAS, the current Mutual Aid Agreement is entitled 28E Agreement for Mutual Assistance for Polk County Fire/Rescue Services and is filed with the Iowa Secretary of State at 10:51 a.m. on June 24, 2015, numbered M508206 (“2015 Agreement”); and

~~**WHEREAS**, the 2015 Agreement has been in force for one year and Parties desire to update; and~~

WHEREAS, the Parties have a desire to assist each other in time of need; and

WHEREAS, the Parties each maintain adequate Emergency Services equipment and personnel to respond to the normal emergencies occurring within their respective jurisdictions; and

WHEREAS, situations may arise in regard to emergencies or circumstances which exhaust available personnel and equipment, or require additional or specialty personnel or additional and/or special equipment that the responsible jurisdiction may not have available at any given time; and

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terminating Party shall have no further responsibility or obligation or benefits from the other Parties to the Agreement, under this Agreement, except as provided herein.

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XI. Amendments

This Agreement represents the entire Agreement of the Parties. Any amendments must be in writing, approved by the governing body of all Parties, and executed by the authorized representatives of all Parties. Any and all amendments must comply with the provisions of Iowa Code section 28E.8. Any and all such requirements shall be done by the then presiding President of the Polk County Fire Chief's Association or President's designee.

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In the event any part or paragraph of this Agreement is declared void as being contrary to Iowa law, the remaining portions of this Agreement that are valid shall continue in full force and effect.

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XV. Applicable Law

This Agreement shall be governed by and construed in accordance with the laws of the State of Iowa (excluding conflicts of laws rules), and applicable federal law.

XVI. Counterparts

This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all such counterparts shall together constitute but one and the same instrument.

28E Agreement for Mutual Assistance For Polk County Area Fire/Rescue Services (2024)

By authorized signature of this Agreement, Parties agree to the 28E Agreement for Mutual Assistance for Polk County Area Fire/Rescue Services (2024).

Legal Name of Jurisdiction: _____

Effective Date: _____

Jurisdiction Official:

Printed Name and Title

Signature

Date

Attest:

Printed Name and Title

Signature

Date

Chief/Dept. Head/Director:

Printed Name and Title

Signature

Date

**RESOLUTION ACCEPTING IOWA DOT OFFER OF CITY BRIDGE FUNDING FOR
THE CENTER STREET BRIDGE OVER LINN CREEK PROJECT, #STR25001**

WHEREAS, the City of Marshalltown, Iowa, has been offered City Bridge Funding for the Center Street Bridge over Linn Creek from the Iowa Department of Transportation; and

WHEREAS, the maximum grant award is \$1.5 Million Dollars; and

WHEREAS, funding will not be available until Federal Fiscal Year 2026.

WHEREAS, the Council has fully examined same and has found same to be in the best interests of the City of Marshalltown, Iowa.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA that the Mayor is hereby authorized to accept the offer of City Bridge Funding for the Center Street Bridge over Linn Creek, #STR25001.

Passed this 24th day of February 2025 and signed this _____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor Greer and City Council
FROM: Heather Thomas, Public Works Director
DATE: February 24, 2025
RE: Accept City Bridge Funding Agreement for Center Street _Linn Creek Bridge

Strategic Plan Objective: This item does not directly contribute to the identified priority goals.

Recommendation: Accept funding agreement, with a maximum grant award of \$1.5 M of Federal Funds.

Budget Impact: We have a conceptual opinion of costs in the amount of \$2,950,000 for engineering and construction (2024 dollars) of this bridge. Accepting this funding agreement does not expend funds but indicate the city is beginning necessary planning processes for a project within the next few years.

Description/Background:

In January 2023, I presented information on the Highway Bridge Program, which could be used as a funding source (competitive grant) for some of our bridges that were deemed in poor condition, meeting certain criteria. Applications were due in October 2023 and I submitted 3 structures, including this one.

In November 2024, city council accepted the offer of this funding for the Center St bridge over Linn Creek (the one south of the viaduct).

The Center St bridge over Linn Creek is deemed in poor condition as it relates to deck and substructure. In December 2024, we hired our bridge inspection team, Calhoun Burns & Associates to evaluate the cost effectiveness of bridge rehab vs replacement.

If rehab was pursued, it would need to include:

1. Rehabilitating the bridge deck, approach replacement.
2. Repairing spalled, delaminated substructure (backwalls and piers)
3. Addressing beam, bearing, and diaphragm corrosion.
4. Cleaning and replacing approach joint sealant.

With review of costs of a rehab project, it was determined that costs would be approaching 80% of a replacement project. When considering life-cycle costs, bridge replacement is going to be a more cost-effective route for the city.

The replacement is estimated to be a 103' x 36'-0 PPCB with high-concrete abutments, 10' trail and 5' sidewalk (56'-2 out-to-out width). In 2024 dollars, construction is estimated to cost \$2.3 Million with \$0.3 M design engineering and \$0.35M construction engineering expenses.

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



Accepting the agreement commits the City to follow the requirements of the City Highway Bridge Program Project Funds, as administered by Iowa DOT. A few bullet points from the agreement:

- This is federal money, meaning we need to meet documentation/project inspection of Federally Funded projects.
- Maximum award of \$1.5 Million, as a reimbursement. 5% retainage will be held until close-out.
- City agrees to let the project within 3 years from date of this agreement (prior to approximately March 2028)
- Letting will be an Iowa DOT Letting.

If accepted, we will work to go out for selection of an engineering consulting team to assist the City with this project. This would likely not be bid until 2027 and depending on material lead time, construction in 2028. With the levee system and flood walls adjacent to the bridge, this will require USACE coordination and permitting. We also have some repairs needed in the floodwall that may make sense to do at the same time.

Attachments:

Funding Agreement



CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson





CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



**IOWA DEPARTMENT OF TRANSPORTATION
Federal-aid Agreement
for a City Highway Bridge Program Project**

RECIPIENT: City of Marshalltown

Project No: BRM-4797(630)--8N-64

Iowa DOT Agreement No: 1-25-HBP-U-005

CFDA No. and Title: 20.205 Highway Planning and Construction

This is an agreement between the city of Marshalltown, Iowa (hereinafter referred to as the RECIPIENT) and the Iowa Department of Transportation (hereinafter referred to as the DEPARTMENT). Iowa Code Sections 306A.7 and 307.44 provide for the RECIPIENT and the DEPARTMENT to enter into agreements with each other for the purpose of financing transportation improvement projects on streets and highways in Iowa with Federal funds.

The Bridge Formula Program (BFP) and the Surface Transportation Block Grant (STBG) Program make Federal funds available for replacement or rehabilitation of highway bridges on public roads on and off the Federal-aid System. A portion of BFP or STBG funds have been set aside for this purpose and designated as the City Bridge Program. In the event Highway Infrastructure Program (HIP) funding is available, it may be included for this same purpose.

Pursuant to the terms of this agreement, applicable statutes, and Local Systems Instructional Memorandum [1.100](#), the DEPARTMENT agrees to provide City Bridge Program funding to the RECIPIENT for the authorized and approved costs for eligible items associated with the project.

Under this agreement, the parties further agree as follows:

1. The RECIPIENT shall be the lead local governmental agency for carrying out the provisions of this agreement.
2. All notices required under this agreement shall be made in writing to the appropriate contact person. The DEPARTMENT's contact person will be the Local Systems Project Development Engineer, Jenifer Bates, and the Local Systems Central Region Field Engineer, Brian Catus. The RECIPIENT's contact person shall be the Public Works Director.
3. The RECIPIENT shall be responsible for the development and completion of the following bridge project:
 - A. FHWA Structure Number: 35400
 - B. Location: SO CENTER ST over LINN CREEK
 - C. Preliminary Estimated Total Eligible Construction Costs: \$1,675,000.00
4. The eligible project construction limits shall include the bridge plus grading and/or paving to reach a "touchdown point" determined by the DEPARTMENT. Eligible project costs include only costs associated with actual construction costs within the eligible project construction limits.
5. Costs associated with work outside the eligible project construction limits, routine maintenance activities, operations, and monitoring expenses, are not eligible. In addition, administrative costs, engineering, inspection, legal, right of way, utility relocations, activities necessary to comply with Federal and State environmental or permit requirements, and fees or interest associated with bonds or loans are not eligible.
6. The RECIPIENT shall receive reimbursement for costs of authorized and approved eligible construction project activities from City Bridge Program funds. The portion of the eligible construction project costs reimbursed by City Bridge Program funds shall be limited to a maximum of 100% of eligible costs or \$1,500,000, whichever is less. Reimbursed costs will be limited to funding made available for cities through the City Bridge Program outlined in Local Systems Instructional Memorandum [1.100](#) in place at the time of this agreement being fully executed.

7. The RECIPIENT shall conduct project development and implementation in compliance with applicable laws, ordinances, and administrative rules. For projects which also include Farm-to-Market funds, the RECIPIENT shall follow all administrative and contracting procedures required for Farm-to-Market projects.
8. The RECIPIENT shall pay for all project costs not reimbursed with City Bridge Program funds.
9. The RECIPIENT shall let the project for bids through the DEPARTMENT.
10. If any part of this agreement is found to be void and unenforceable, the remaining provisions of this agreement shall remain in effect.
11. It is the intent of both (all) parties that no third-party beneficiaries be created by this agreement.
12. Responsibility for compliance with the Federal and State laws, regulations, policies, or procedures required by this agreement is not assignable without the prior written consent of the DEPARTMENT.
13. The project shall be let to contract within 3 years of the date this agreement is signed by the DEPARTMENT. If not, the RECIPIENT may be in default, for which the DEPARTMENT may revoke funding commitments. This agreement may be extended for a period of 6 months upon receipt of a written request from the RECIPIENT at least 30 days prior to the 3-year deadline.
14. This agreement and the attached Exhibit 1 constitute the entire agreement between the DEPARTMENT and the RECIPIENT concerning this project. Representations made before the signing of this agreement are not binding, and neither party has relied upon conflicting representations in entering into this agreement. Any change or alteration to the terms of this agreement shall be made in the form of an addendum to this agreement. The addendum shall become effective only upon written approval of the DEPARTMENT and the RECIPIENT.

IN WITNESS WHEREOF, each of the parties hereto has executed this Agreement as of the date shown opposite its signature below.

RECIPIENT: City of Marshalltown

By _____ Date _____, _____

Title _____

I, _____, certify that I am the Clerk of the City, and that _____,

who signed said Agreement for and on behalf of the City was duly authorized to execute the same by virtue of a

formal Resolution duly passed and adopted by the City, on the _____ day of _____, _____.

Signed _____ Date _____, _____
City Clerk Marshalltown, Iowa

IOWA DEPARTMENT OF TRANSPORTATION
Transportation Development Division

By _____ Date _____, _____

Eryn M. Stone, P.E.
Urban Engineer
Local Systems Bureau

EXHIBIT 1

General Agreement Provisions for use of Federal Highway Funds on Non-primary Projects

Unless otherwise specified in this agreement, the RECIPIENT shall be responsible for the following:

1. General Requirements

- a. The RECIPIENT shall take the necessary actions to comply with applicable State and Federal laws and regulations. To assist the RECIPIENT, the DEPARTMENT has provided guidance in the Federal-aid Project Development Guide (Guide) and the Instructional Memorandums to Local Public Agencies (I.M.s) that are referenced by the Guide. Both are available on-line at: https://www.iowadot.gov/local_systems/publications/im/lpa_ims.htm. The RECIPIENT shall follow the applicable procedures and guidelines contained in the Guide and I.M.s in effect at the time project activities are conducted.
- b. In accordance with Title VI of the Civil Rights Act of 1964 and associated subsequent nondiscrimination laws, regulations, and executive orders, the RECIPIENT shall not discriminate against any person on the basis of race, color, national origin, sex, age, or disability. In accordance with Iowa Code Chapter 216, the RECIPIENT shall not discriminate against any person on the basis of race, color, creed, age, sex, sexual orientation, gender identity, national origin, religion, pregnancy, or disability. The RECIPIENT agrees to comply with the requirements outlined in [I.M. 1.070](#), Title VI and Nondiscrimination Requirements, which includes the requirement to provide a copy of the Subrecipient's Title VI Plan or Agreement and Standard DOT Title VI Assurances to the DEPARTMENT.
- c. The RECIPIENT shall comply with the requirements of Title II of the Americans with Disabilities Act of 1990 (ADA), Section 504 of the Rehabilitation Act of 1973 (Section 504), the associated Code of Federal Regulations (CFR) that implement these laws, and the guidance provided in [I.M. 1.080](#), ADA Requirements. When bicycle and/or pedestrian facilities are constructed, reconstructed, or altered, the RECIPIENT shall make such facilities compliant with the ADA and Section 504, which includes following the requirements set forth in Chapter 12A for sidewalks and Chapter 12B for Bicycle Facilities of the [Iowa DOT Design Manual](#).
- d. To the extent allowable by law, the RECIPIENT agrees to indemnify, defend, and hold the DEPARTMENT harmless from any claim, action or liability arising out of the design, construction, maintenance, placement of traffic control devices, inspection, or use of this project. This agreement to indemnify, defend, and hold harmless applies to all aspects of the DEPARTMENT's application review and approval process, plan and construction reviews, and funding participation.
- e. As required by the 2 CFR 200.501 "Audit Requirements," a non-Federal entity expending \$750,000 or more in Federal awards in a year shall have a single or program-specific audit conducted for that year in accordance with the provision of that part. Auditee responsibilities are addressed in Subpart F of 2 CFR 200. The Federal funds provided by this agreement shall be reported on the appropriate Schedule of Expenditures of Federal Awards (SEFA) using the Catalog of Federal Domestic Assistance (CFDA) number and title as shown on the first page of this agreement. If the RECIPIENT will pay initial project costs and request reimbursement from the DEPARTMENT, the RECIPIENT shall report this project on its SEFA. If the DEPARTMENT will pay initial project costs and then credit those accounts from which initial costs were paid, the DEPARTMENT will report this project on its SEFA. When the DEPARTMENT will pay initial project costs and credit those accounts from which initial costs were paid, the RECIPIENT shall not report this project on its SEFA.
- f. The RECIPIENT shall supply the DEPARTMENT with all information required by the Federal Funding Accountability and Transparency Act of 2006 and 2 CFR Part 170.
- g. The RECIPIENT shall comply with the following Disadvantaged Business Enterprise (DBE) requirements:
 - i. The RECIPIENT shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. The RECIPIENT shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts.
 - ii. The RECIPIENT shall comply with the requirements of [I.M. 5.010](#), DBE Guidelines.

- iii. The DEPARTMENT's [DBE program](#), as required by 49 CFR Part 26 and as approved by the Federal Highway Administration (FHWA), is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the RECIPIENT of its failure to carry out its approved program, the DEPARTMENT may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 et seq.).
- h. Termination of funds. Notwithstanding anything in this agreement to the contrary, and subject to the limitations set forth below, the DEPARTMENT shall have the right to terminate this agreement without penalty and without any advance notice as a result of any of the following: 1) The Federal government, legislature or governor fail in the sole opinion of the DEPARTMENT to appropriate funds sufficient to allow the DEPARTMENT to either meet its obligations under this agreement or to operate as required and to fulfill its obligations under this agreement; or 2) If funds are de-appropriated, reduced, not allocated, or receipt of funds is delayed, or if any funds or revenues needed by the DEPARTMENT to make any payment hereunder are insufficient or unavailable for any other reason as determined by the DEPARTMENT in its sole discretion; or 3) If the DEPARTMENT's authorization to conduct its business or engage in activities or operations related to the subject matter of this agreement is withdrawn or materially altered or modified. The DEPARTMENT shall provide the RECIPIENT with written notice of termination pursuant to this section.

2. Programming and Federal Authorization

- a. The RECIPIENT shall be responsible for including the project in the appropriate Regional Planning Affiliation (RPA) or Metropolitan Planning Organization (MPO) Transportation Improvement Program (TIP). The RECIPIENT shall also ensure that the appropriate RPA or MPO, through their TIP submittal to the DEPARTMENT, includes the project in the Statewide Transportation Improvement Program (STIP). If the project is not included in the appropriate fiscal year of the STIP, Federal funds cannot be authorized.
- b. The RECIPIENT must show federal aid funding activity to receive the programmed amount authorized for the project. If there is no funding activity for nine or more months after the previous funding activity, the remaining unused programmed amount will be de-obligated from the project and there will be no further federal aid reimbursement issued for the project. If the RECIPIENT knows in advance that funding activity will not occur for nine months or more, the DEPARTMENT's Contract Administrator needs to be notified to determine if programming or authorization of funds can be adjusted or other options can be explored.
- c. Upon receipt of Federal Highway Administration (FHWA) authorization a Federal Award Identification Number (FAIN) will be assigned to this project by the FHWA based on a methodology that incorporates identifying information about the federal award such as the federal funding program code and the federal project number. This FAIN will be used to identify this project and award on the federal government's listing of financial assistance awards consistent with the Federal Funding Accountability and Transparency Act of 2006 (FFATA) at usaspending.gov.
- d. A period of performance for this federal funding award will be established at the time of FHWA authorization. The start date of the period of performance will be the FHWA authorization date. The project end date (PED) will be determined according to the methodology in [I.M. 1.200](#), Federal Funds Management. Costs incurred before the start date or after the PED of the period of performance will not be eligible for reimbursement.

3. Design

- a. The RECIPIENT shall be responsible for the design of the project, including all necessary plans, specifications, and estimates (PS&E). The project shall be designed in accordance with the design guidelines provided or referenced by the DEPARTMENT in the Guide and applicable I.M.s.

4. Environmental Requirements and other Agreements or Permits

- a. The RECIPIENT shall take the appropriate actions and prepare the necessary documents to fulfill the FHWA requirements for project environmental studies including historical/cultural reviews and location approval. The RECIPIENT shall complete any mitigation agreed upon in the FHWA approval document. These procedures

are set forth in [I.M. 3.020](#), Concept Statement Instructions; [4.020](#), NEPA Process; [4.110](#) Threatened and Endangered Species; and [4.120](#), Cultural Resource Regulations.

- b. If farmland is to be acquired, whether for use as project right-of-way or permanent easement, the RECIPIENT shall follow the procedures in I.M. [4.170](#), Farmland Protection Policy Act.
- c. The RECIPIENT shall obtain project permits and approvals, when necessary, from the Iowa Department of Cultural Affairs (State Historical Society of Iowa; State Historic Preservation Officer), Iowa Department of Natural Resources, U.S. Coast Guard, U.S. Army Corps of Engineers, the DEPARTMENT, or other agencies as required. The RECIPIENT shall follow the procedures in I.M. [4.130](#), 404 Permit Process; [4.140](#), Storm Water Permits; [4.150](#) Iowa DNR Floodplain Permits and Regulations; [4.190](#), Highway Improvements in the Vicinity of Airports or Heliports; and [4.160](#), Asbestos Inspection, Removal, and Notification Requirements.
- d. In all contracts entered into by the RECIPIENT, and all subcontracts, in connection with this project that exceed \$100,000, the RECIPIENT shall comply with the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act, and all their regulations and guidelines. In such contracts, the RECIPIENT shall stipulate that any facility to be utilized in performance of or to benefit from this agreement is not listed on the Environmental Protection Agency (EPA) List of Violating Facilities or is under consideration to be listed.

5. Right-of-Way, Railroads and Utilities

- a. The RECIPIENT shall acquire the project right-of-way, whether by lease, easement, or fee title, and shall provide relocation assistance benefits and payments in accordance with the procedures set forth in [I.M. 3.600](#), Right-of-Way Acquisition, and the DEPARTMENT's Right of Way Bureau [Local Public Agency Manual](#). The RECIPIENT shall contact the DEPARTMENT for assistance, as necessary, to ensure compliance with the required procedures, even though no Federal funds are used for right-of-way activities. Acquisition activities may begin prior to FHWA Environmental Concurrence. However, such acquisitions cannot affect the National Environmental Policy Act (NEPA) decision making process.
- b. If a railroad crossing or railroad tracks are within or adjacent to the project limits, the RECIPIENT shall obtain agreements, easements, or permits as needed from the railroad. The RECIPIENT shall follow the procedures in [I.M. 3.670](#), Work on Railroad Right-of-Way and [I.M. 3.680](#), Federal-aid Projects Involving Railroads.
- c. The RECIPIENT shall comply with the DEPARTMENT'S [Policy for Accommodating Utilities on the County and City Non-Primary Federal-aid Road System](#) for projects on non-primary Federal-aid highways. For projects connecting to or involving some work inside the right-of-way for a primary highway, the RECIPIENT shall follow the DEPARTMENT's [Policy for Accommodating and Adjustment of Utilities on Primary Road System](#). The RECIPIENT should also use the procedures outlined in [I.M. 3.640](#), Utility Accommodation and Coordination, as a guide to coordinating with utilities.

6. Contract Procurement

The following provisions apply only to projects involving physical construction or improvements to transportation facilities:

- a. The project plans, specifications, and cost estimate (PS&E) shall be prepared and certified by a professional engineer, architect, or landscape architect, as applicable, licensed in the State of Iowa.
- b. For projects let through the DEPARTMENT, the RECIPIENT shall be responsible for the following:
 - i. Prepare and submit the PS&E and other contract documents to the DEPARTMENT for review and approval in accordance with [I.M. 3.700](#), Check and Final Plans and [I.M. 3.500](#), Bridge or Culvert Plans, as applicable.
 - ii. The contract documents shall use the DEPARTMENT's Standard Specifications for Highway and Bridge Construction. Prior to their use in the PS&E, specifications developed by the RECIPIENT for individual construction items shall be approved by the DEPARTMENT.

- iii. Follow the procedures in [I.M. 5.030](#), Iowa DOT Letting Process, to analyze the bids received, make a decision to either award a contract to the lowest responsive bidder or reject all bids, and if a contract is awarded, execute the contract documents in Doc Express.
- c. For projects that are let locally by the RECIPIENT, the RECIPIENT shall follow the procedures in [I.M. 5.120](#), Local Letting Process - Federal-aid.
- d. The RECIPIENT shall forward a completed Project Development Certification ([Form 730002](#)) to the DEPARTMENT in accordance with [I.M. 3.710](#), Project Development Certification Instructions. The project shall not receive FHWA Authorization for construction or be advertised for bids until after the DEPARTMENT has reviewed and approved the Project Development Certification.
- e. If the RECIPIENT is a city, the RECIPIENT shall comply with the public hearing requirements of the Iowa Code section 26.12.
- f. The RECIPIENT shall not provide the contractor with notice to proceed until after receiving notice in Doc Express that the Iowa DOT has concurred in the contract execution.

7. Construction

- a. A full-time employee of the RECIPIENT shall serve as the person in responsible charge of the construction project. For cities that do not have any full-time employees, the mayor or city clerk will serve as the person in responsible charge, with assistance from the DEPARTMENT.
- b. Traffic control devices, signing, or pavement markings installed within the limits of this project shall conform to the "Manual on Uniform Traffic Control Devices for Streets and Highways" per 761 IAC Chapter 130. The safety of the general public shall be assured through the use of proper protective measures and devices such as fences, barricades, signs, flood lighting, and warning lights as necessary.
- c. For projects let through the DEPARTMENT, the project shall be constructed under the DEPARTMENT's Standard Specifications for Highway and Bridge Construction and the RECIPIENT shall comply with the procedures and responsibilities for materials testing according to the DEPARTMENT's Materials I.M.s. Available on-line at: <http://www.iowadot.gov/erl/current/IM/navigation/nav.htm>.
- d. For projects let locally, the RECIPIENT shall provide materials testing and certifications as required by the approved specifications.
- e. If the DEPARTMENT provides any materials testing services to the RECIPIENT, the DEPARTMENT will bill the RECIPIENT for such testing services according to its normal policy as per [Materials I.M. 103](#), Inspection Services Provided to Counties, Cities, and Other State Agencies.
- f. The RECIPIENT shall follow the procedures in [I.M. 6.000](#), Construction Inspection, and the DEPARTMENT's Construction Manual, as applicable, for conducting construction inspection activities.

8. Reimbursements

- a. After costs have been incurred, the RECIPIENT shall submit to the DEPARTMENT periodic itemized claims for reimbursement for eligible project costs. Requests for reimbursement shall be made at least once every six months, but not more than bi-weekly. The RECIPIENT shall follow [I.M. 6.020](#) Payment and Reimbursement Processes for requesting reimbursement.
- b. To ensure proper accounting of costs, reimbursement requests for costs incurred prior to June 30 shall be submitted to the DEPARTMENT by August 1.
- c. Reimbursement claims shall include a certification that all eligible project costs, for which reimbursement is requested, have been reviewed by an official or governing board of the RECIPIENT, are reasonable and proper, have been paid in full, and were completed in substantial compliance with the terms of this agreement.

- d. Reimbursement claims shall be submitted on forms identified by the DEPARTMENT along with all required supporting documentation. The DEPARTMENT will reimburse the RECIPIENT for properly documented and certified claims for eligible project costs. The DEPARTMENT may withhold up to 5% of the Federal share of construction costs or 5% of the total Federal funds available for the project, whichever is less. Reimbursement will be made either by State warrant or by crediting other accounts from which payment was initially made. If, upon final audit or review, the DEPARTMENT determines the RECIPIENT has been overpaid, the RECIPIENT shall reimburse the overpaid amount to the DEPARTMENT. After the final audit or review is complete and after the RECIPIENT has provided all required paperwork, the DEPARTMENT will release the Federal funds withheld.
- e. The total funds collected by the RECIPIENT for this project shall not exceed the total project costs. The total funds collected shall include any Federal or State funds received, any special assessments made by the RECIPIENT (exclusive of any associated interest or penalties) pursuant to Iowa Code Chapter 384 (cities) or Chapter 311 (counties), proceeds from the sale of excess right-of-way, and any other revenues generated by the project. The total project costs shall include all costs that can be directly attributed to the project. In the event that the total funds collected by the RECIPIENT do exceed the total project costs, the RECIPIENT shall either:
 - i. In the case of special assessments, refund to the assessed property owners the excess special assessments collected (including interest and penalties associated with the amount of the excess), or
 - ii. Refund to the DEPARTMENT all funds collected in excess of the total project costs (including interest and penalties associated with the amount of the excess) within 60 days of the receipt of any excess funds. In return, the DEPARTMENT will either credit reimbursement billings to the FHWA or credit the appropriate State fund account in the amount of refunds received from the RECIPIENT.

9. Project Close-out

- a. Within 30 days of completion of construction or other activities authorized by this agreement, the RECIPIENT shall provide written notification to the DEPARTMENT. The RECIPIENT shall follow and request a final audit, in accordance with the procedures in [I.M. 6.110](#), Final Review, Audit, and Close-out Procedures for Federal-aid, Federal-aid Swap, and Farm-to-Market Projects. Failure to comply with the procedures will result in loss of federal funds remaining to be reimbursed and the repayment of funds already reimbursed. The RECIPIENT may be suspended from receiving federal funds on future projects.
- b. The RECIPIENT shall provide a certification by a professional engineer, architect, or landscape architect as applicable, licensed in the State of Iowa, indicating the construction was completed in substantial compliance with the project plans and specifications.
- c. Final reimbursement of Federal funds shall be made only after the DEPARTMENT accepts the project as complete.
- d. The RECIPIENT shall maintain all books, documents, papers, accounting records, reports, and other evidence pertaining to costs incurred for the project. The RECIPIENT shall also make these materials available at all reasonable times for inspection by the DEPARTMENT, FHWA, or any authorized representatives of the Federal Government. Copies of these materials shall be furnished by the RECIPIENT if requested. Such documents shall be retained for at least 3 years from the date of FHWA approval of the final closure document. Upon receipt of FHWA approval of the final closure document, the DEPARTMENT will notify the RECIPIENT of the record retention date.
- e. The RECIPIENT shall maintain, or cause to be maintained, the completed improvement in a manner acceptable to the DEPARTMENT and the FHWA.

**RESOLUTION SETTING PUBLIC HEARING FOR PROPOSED
PROPERTY TAX LEVY FOR FY26 BUDGET**

WHEREAS, City Council is required under HF718 and SF2442 to set a public hearing for the proposed tax levy for the Fiscal Year ending June 30, 2026

WHEREAS, the hearing must have its own publication/posting and included in the mailed notice to property tax owners sent by the County.

WHEREAS, the hearing must be held as a stand-alone meeting, with its own agenda and minutes and no other city business may be on the agenda or discussed during the meeting.

WHEREAS, the City Council finds that setting the public hearing for the proposed property tax levy is in the best interest of the City of Marshalltown.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Marshalltown, Iowa, that the hearing for the proposed property tax levy for Fiscal Year ending June 30, 2026, be set on March 24, 2025 at 5:00 p.m.

Passed this 24th day of February 2025, and signed this _____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor and City Council
FROM: Diana Steiner, Finance Director
DATE: February 14, 2025
RE: Set public hearing for proposed property tax levy for FY26

Strategic Plan Objective: N/A

Recommendation: Set public hearing on proposed property tax levy for a special meeting on March 24, 2025 at 5:00 PM.

Budget Impact: The proposed property tax levy rate that is published is the maximum levy rates that can be certified. The rate can be lowered after the public hearing but cannot exceed what was published.

Description/Background: House File 718, passed during the 2023 Legislative Session, and Senate File 2442, passed during the 2024 Legislative Session, requires that a hearing on the property tax rate be held prior to completion of the budget. The proposed property tax hearing is intended to spotlight the change in the property tax levy that is being requested by the City for the upcoming fiscal year. This hearing must be held as a stand-alone meeting, with its own agenda and minutes. No other city business may be on the agenda or discussed during the meeting. This hearing requires a public notice. For cities with a population of more than 200 in the last official census, the notice must be published in a newspaper of general circulation within the city not less than 10 and not more than 20 days prior to the date of the public hearing.

In addition to the published public notice, the proposed property tax hearing also requires a notice to be mailed directly to each taxpayer by March 15th of each year. This property tax notice mailer will show the proposed property tax hearing time, date and location. The mailer also shows the same information for the County and K-12 school proposed property tax hearings. The mailed notice will include the current rate and property tax revenue for 2024-2025, the effective rate for budget year 2025-2026 if no further revenue was requested, and the proposed revenue and total rate for budget year 2025-2026. The County is responsible for sending the mailer out and it will show a breakdown of the consolidated rate by the authority that receives the property tax.

Please refer to the Notice of Public Hearing Proposed Property Tax Levy form:

- The first column is what was certified for each tax levy for this current fiscal year (FY25) for property taxes only. It does not include gas and electric utilities that are taxed based on distribution. The City's regular total property tax revenues are \$14,533,067 with a regular City property tax rate of \$16.00.
- The second column is showing if the tax levied dollars of \$14,533,067 stayed the same for the next fiscal year (FY26) as they were in FY25, the tax rate would be \$14.84 due to the \$30 million increase in taxable valuations. This may be interesting to know, but with rising costs

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



in wages, insurance, utilities, vehicles, supplies, etc. it is not realistic to continue to operate on the same amount of dollars.

- The third column is showing levied property tax dollars of \$15,031,079 for FY26. This is an increase of \$498,012 or 3.4 % increase. However, the overall property tax rate of \$16 is staying the same as it was in FY25. This was primarily accomplished by using an additional \$1.4 million in the employee benefit fund balance to bring down the rate.

The bottom of the form shows what property owners that own residential or commercial property would pay if they have an assessed property value of \$100,000 and \$300,000 respectively in FY25 and \$110,000 and \$330,000 in FY26. Since FY26 is an even year, most properties are unlikely to increase in value by 10%, but the legislature wanted to show the change in property tax rates are affected by both valuations and rate changes, since every property is different. Here is an example of the computation:

RESIDENTIAL	FY25	<u>FY26 no increase in valuations</u>	<u>FY26 if 10% increase in valuations</u>
Assessed valuation	\$ 100,000	\$ 100,000	\$ 110,000
Residential rollback (set by State)	46.3428%	47.4316%	47.4316%
Taxable valuation	\$ 46,343	\$ 47,432	\$ 52,175
Divided by 1,000	1000	1000	1000
	\$ 46.34	\$ 47.43	\$ 52.18
City tax rate *NO CHANGE	\$ 16	\$ 16	\$ 16
Property taxes charged	\$ 741	\$ 759	\$ 835
Comparison between fiscal years		\$ 17	\$ 94
% increase (decrease) between fiscal years		2.4%	12.68%
COMMERCIAL	FY25	<u>FY26 no increase in valuations</u>	<u>FY26 if 10% increase in valuations</u>
Assessed valuation	\$ 300,000	\$ 300,000	\$ 330,000
Residential rate first \$150,000, then 90%	Blend	Blend	Blend
Taxable valuation	\$ 204,514	\$ 206,147	\$ 233,147
Divided by 1,000	1000	1000	1000
	\$ 204.51	\$ 206.15	\$ 233.15
City tax rate *NO CHANGE	\$ 16	\$ 16	\$ 16
Property taxes charged	\$ 3,272	\$ 3,298	\$ 3,730
Comparison between fiscal years		\$ 26	\$ 458
% increase (decrease) between fiscal years		0.8%	14.00%

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



CITY NAME: MARSHALLTOWN **NOTICE OF PUBLIC HEARING - CITY OF MARSHALLTOWN - PROPOSED PROPERTY TAX LEVY** **CITY #: 64-611**
Fiscal Year July 1, 2025 - June 30, 2026

The City Council will conduct a public hearing on the proposed Fiscal Year City property tax levy as follows:

Meeting Date: 3/24/2025 Meeting Time: 05:00 PM Meeting Location: City Council Chambers, 10 West State Street, Marshalltown, IA 50158

At the public hearing any resident or taxpayer may present objections to, or arguments in favor of the proposed tax levy. After the hearing of the proposed tax levy, the City Council will publish notice and hold a hearing on the proposed city budget.

City Website (if available)
www.marshalltown-ia.gov

City Telephone Number
(641) 754-5760 ext: 2100

Iowa Department of Management	Current Year Property Tax	Certified 2024 - 2025	Budget Year Property Tax	Effective 2025 - 2026	Budget Year Property Tax	Proposed 2025 - 2026
Taxable Valuations for Non-Debt Service		903,319,070		933,336,870		933,336,870
Consolidated General Fund		7,680,226		7,680,226		7,856,876
Operation & Maintenance of Public Transit		361,328		361,328		373,335
Aviation Authority		0		0		0
Liability, Property & Self Insurance		491,369		491,369		459,370
Support of Local Emergency Mgmt. Comm.		33,911		33,911		35,747
Unified Law Enforcement		0		0		0
Police & Fire Retirement		1,166,122		1,166,122		1,223,511
FICA & IPERS (If at General Fund Limit)		773,015		773,015		779,383
Other Employee Benefits		1,739,603		1,739,603		1,414,911
Capital Projects (Capital Improv. Reserve)		609,740		609,740		630,002
Taxable Value for Debt Service		948,526,185		975,543,571		975,543,571
Debt Service		1,677,753		1,677,753		2,257,944
CITY REGULAR TOTAL PROPERTY TAX		14,533,067		14,533,067		15,031,079
CITY REGULAR TAX RATE		16.00000		14.84002		16.00000
Taxable Value for City Ag Land		5,532,536		5,498,242		5,498,242
Ag Land		16,618		16,618		16,516
CITY AG LAND TAX RATE		3.00375		3.02242		3.00375
Tax Rate Comparison-Current VS. Proposed						
Residential property with an Actual/Assessed Valuation of \$100,000/\$110,000	Current Year	Certified	Budget Year	Proposed	Percent Change	
		2024/2025		2025/2026		
City Regular Residential		741		835	12.69	
Commercial property with an Actual/Assessed Valuation of \$300,000/\$330,000	Current Year	Certified	Budget Year	Proposed	Percent Change	
		2024/2025		2025/2026		
City Regular Commercial		3,272		3,730	14.00	

Note: Actual/Assessed Valuation is multiplied by a Rollback Percentage to get to the Taxable Valuation to calculate Property Taxes. Residential and Commercial properties have the same Rollback Percentage at \$100,000 Actual/Assessed Valuation.

Reasons for tax increase if proposed exceeds the current:

General Fund & Transit increased due to wage cost of living, utilities, and supplies increasing. FICA/IPERS and Pol/Fire Retirement are a % of wages. Capital projects cost more due to inflation. The debt service levy for FY25 utilized more of the Local Option Sales Tax fund balance than in FY26.

**RESOLUTION APPROVING THE LEASE AGREEMENT WITH THE CENTRAL IOWA
RIVER GUN CLUB OF MARSHALLTOWN, IOWA**

WHEREAS, there has been presented to the Marshalltown City Council a form of lease for approval by the City of Marshalltown, Iowa, and the Central Iowa River Gun Club of Marshalltown, Iowa for a term of ten (10) years from and after the 1st day of March 2025, and up to noon of the 28th day of February 2035, for the use and occupancy by lessees of the large room under the north end of the Viaduct on South Center Street near the Boone Street intersection in Marshalltown, Iowa; and

WHEREAS, pursuant to Section 364.7 of the Iowa Code, the council has held a public hearing regarding the lease proposal; and

WHEREAS, this Council has considered the terms, conditions and intended use of such room or space, together with the provisions provided for termination, and rights of inspection by the City and the Iowa Department of Transportation, which is to be without cost or expense of the City for any remodeling, repair or maintenance and that such lease is in the best interest of the city and should be approved.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA:

Section 1. This Council hereby approves the attached lease agreement with the Central Iowa River Gun Club of Marshalltown, Iowa, subject to the conditions of this Resolution which are made a part of that agreement, for a ten (10) year period beginning March 1, 2025, and ending at noon on the 28th day of February 2035, the right and occupancy of:

The large room under the north end of the Viaduct on South Center Street near the Boone intersection, Marshalltown, Iowa. Said large room, located under the traveled portion of the viaduct, is a part of the understructure to the north approach of the said viaduct.

Section 2. Said room shall be used by the lessee only as an indoor shooting range and said lessee shall be responsible for any costs of maintenance, upkeep and repair which shall in no way injure or damage the interior thereof and shall at all time be subject to inspection by the City Engineer and engineers of the Iowa Department of Transportation.

Section 3. In the event it becomes necessary for structural maintenance or repair, the lessees shall immediately vacate the space herein for such time as is necessary for such purposes.

Section 4. The City Administrator is hereby authorized to execute such lease for and on behalf of the City of Marshalltown.

Passed this 24th day of February 2025, and signed this ____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor
ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor and City Council
FROM: Alicia Hunter, City Clerk
DATE: February 12, 2025
RE: Lease Agreement with Central Iowa River Gun Club

Strategic Plan:

- ☐ Strategy 1: Expand and improve development in the community.
- ☐ Strategy 2: Enhance Marshalltown's public image.
- ☐ Strategy 3: Continually improve and sustain the City's infrastructure, organization, and services.
- ☒ Strategy 4: Partner with citizens, for-profit, non-profit, and others to improve quality of life.

Plan Objective: Work with other entities on partnerships which benefit the community.

Recommendation: Approve the 10-year lease agreement renewal.

Budget Impact: The \$100 lease fee for the ten years will cover the cost of the required publication.

Description/Background: The City of Marshalltown and the Central Iowa River Gun Club have a current 10-year lease agreement that expires 2/28/25. The Club wishes to renew the agreement for the operation of a gun range located within the bridge structure at the north end of the South Center Street viaduct.

State law requires a public hearing for lease periods longer than 3 years which will be held on February 24, 2025.

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



CITY OF MARSHALLTOWN, IOWA
LEASE AGREEMENT WITH CENTRAL IOWA RIVER GUN CLUB OF MARSHALLTOWN, IOWA

THIS LEASE AND AGREEMENT made on this ____ day of February 2025, by and between the City of Marshalltown ("City"), party of the first part, and the Central Iowa River Gun Club, of Marshalltown, Iowa, ("Club"), party of the second part,

WITNESSETH: That the said first party for and in consideration of One Hundred Dollars (\$100.00) and other valuable consideration, payable on March 1, 2025, does hereby grant, demise, and lease to the second party the following described property:

The large room under the north end of the viaduct on South Center Street near the Boone Street intersection, Marshalltown, Iowa. Said large room, located under the traveled portion of the viaduct, is part of the understructure to the north approach of the said viaduct,

For the term of ten years, beginning March 1, 2025, and ending at noon on the 28th day of February 2035, all subject to the conditions and terms hereafter specified:

1. When said room is in use, there shall be present at all times a Club member whose membership is conditioned upon the strict compliance with all Club rules, who has acknowledged receipt and understanding of those rules and who has promised to strictly abide by them;
2. Keys to said room are not provided to non-members;
3. An Insurance Binder that names the City as additional insured for limits required by City of Marshalltown Ordinance 10.009 shall be obtained and a certificate of insurance submitted to the City Clerk;
4. Said room is not assigned without the Lessor's permission;
5. Said room shall be used exclusively as an indoor shooting range and said lessee shall be responsible for any costs of maintenance, upkeep, and repair and shall at all times be designed and altered to in no way to injure or damage in any manner, the walls or ceilings of said room, or damage or injure in any way the viaduct or any portion thereof;
6. In designing or altering the interior of said room, said work shall be done with the approval of the City Engineer and also with the approval of the Iowa Department of Transportation, if its approval be required;
7. At the end of this lease and any extensions, all personal property of the Club and fixtures which may be removed without causing damage to the premises shall be removed and said premises left in a broom-cleaned condition to include the clean-up of all spent rounds and lead remnants.
8. This lease may be canceled on thirty (30) days written notice to said Lessee or party of the second part by the City of Marshalltown or the Iowa Department of Transportation.
9. Said second party recognizes the primary purpose of said viaduct for pedestrian and vehicular traffic, and hereby agrees to immediately, and temporarily vacate said premises upon written or oral notification by the City or Iowa Department of Transportation that said vacation is necessary for maintenance, construction, or repair of said viaduct. When practical, the City shall give the Club as much notice as possible for larger projects that may require the vacation of the space or the temporary or permanent removal of the Club's possessions. The Club shall assist in moving its items to facilitate the work. Failure to render immediate possession shall render said Lessee and occupant immediately liable to eviction and all damages occasioned by delay or hinder.
10. The Iowa Department of Transportation or the Department of Public Works of the City of Marshalltown, Iowa, reserves the right of entry for inspection at any time to ascertain the condition of the viaduct or said approach.

Dated this ____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

CENTRAL IOWA RIVER GUN CLUB,
MARSHALLTOWN, IOWA

Joel Greer, Mayor

By:

ATTEST:

Alicia Hunter, City Clerk

**RESOLUTION APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT
AND COST FOR THE EAST MAIN STREET & CENTER STREET
RECONSTRUCTION PROJECT, IN THE CITY OF MARSHALLTOWN, IOWA,
BEING PROJECT NO. STR22-002**

WHEREAS, there was placed on file in the office of the Clerk of the City of Marshalltown, Iowa, proposed plans and specifications, proposed form of contract and estimated cost for a public improvement in the City of Marshalltown, Iowa, for the East Main Street and Center Street Reconstruction, Project No. STR22-002, as fully set forth in the resolution ordering same, and that public notice of hearing on such plans, specifications and form of contract were duly published in the Marshalltown Times-Republican in time for hearing now before the Council, and

WHEREAS, written objections to the plans, specifications and form of contract have been called for and no such written objections have been filed with the City Clerk, and oral objections being called for and no oral objections being made in open Council, it is the decision of this Council that such plans, specifications, form of contract and estimate of cost should be approved.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the plans, specifications, form of contract and estimated cost heretofore placed on file and upon which public notice has been duly given and no objections thereto have been made either in writing or in open council, the Council does now adopt and approve the plans, specifications, form of contract and estimate of cost for Project No STR22-002, being the East Main Street and Center Street Reconstruction Project in the city of Marshalltown, Iowa.

Passed this 24th day of February 2025, and signed this _____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor Greer and City Council
FROM: Heather Thomas, Public Works Director
DATE: February 24, 2025
RE: E Main St & Center St Reconstruction (STR 22-002) _Approval following Public Hearing

2023 Strategic Plan:

- ☒ Strategy 1: Expand and improve development in the community.
- ☒ Strategy 2: Enhance Marshalltown's public image.
- ☒ Strategy 3: Continually improve and sustain the City's infrastructure, organization, and services.
- ☒ Strategy 4: Partner with citizens, for-profit, non-profit, and others to improve quality of life.

2023 Plan Objective:

Plan for and Construct New Infrastructure; Invest in Downtown Redevelopment; Identify public projects where aesthetics can be enhanced through functional improvements; Plan and fund improvements to City's infrastructure; Utilize the Arts and Culture Master Plan to partner with the Arts & Culture Alliance on projects and initiatives

2025 Plan Objective: Two of the "High Priority" Goals established included:

- Continue Implementing Downtown Master Plan
- Create Sprinkling Incentive Program for Downtown

Recommendation:

Staff recommends approving plans, specifications, form of contract, and opinion of probable cost for said improvements following the public hearing.

Budget Impact:

This project includes a Base Bid with two Bid Add Alternates with opinion of probable costs, as follows:

Package	Construction Cost Opinion	Contingency (~5%)	Total
Base Bid - E Main St / Center St Reconstruction (City/County/MWW)	\$ 7,949,124.75	\$ 400,875.25	\$ 8,350,000.00
Bid Alternate 1 – Welcome Center Parking Lot (MCSD)	\$ 283,761.50	\$ 14,190.00	\$ 297,951.50
Bid Alternate 2 – Welcome Center/MWW - E/W Alley (MCSD/MWW)	\$ 44,067.20	\$ 2,210.00	\$ 46,277.20
TOTAL	\$ 8,276,953.45	\$ 417,275.25	\$ 8,694,228.70

City staff are currently working with project partners, including Marshalltown Water Works, Marshalltown Community School District, and Marshall County, to put together a funding package for this project. We will present a funding package at the time of award. Council has previously designated \$7,146,000 in 2023 GO Bonds (Fund 365) towards the engineering and construction of this project.

CITY COUNCIL

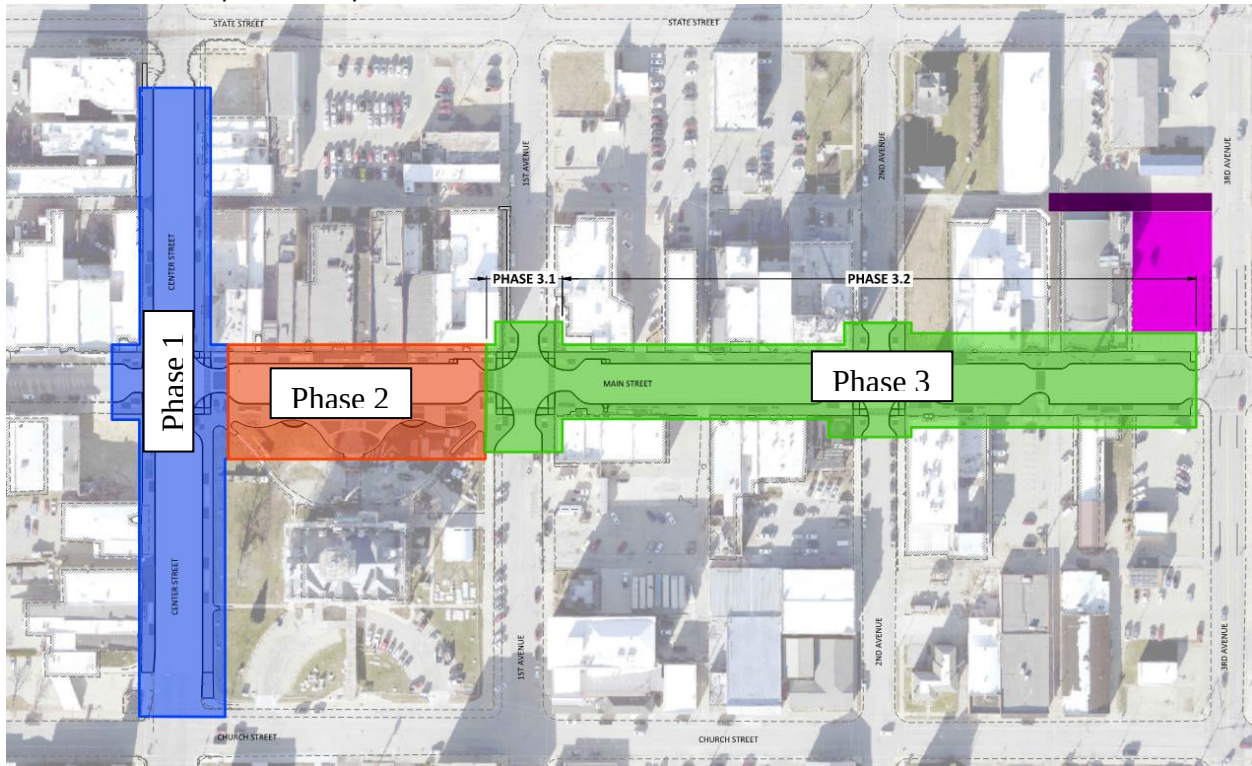
Melisa Fonseca, Barry Kell, Mike Ladehoff, Mark Mitchell,
Greg Nichols, Jeff Schneider, Gary Thompson



Description/Background:

This project is a continuation of the Downtown Implementation Plan, as Phase 2. The base bid includes street reconstruction, water main replacement, new storm sewer, a community event space in the block north of the Courthouse, increased lighting, and streetscape amenities. Alternates include the Marshalltown Community School District's Welcome Center parking lot and the alley just north of there and adjacent to Marshalltown Water Works.

Design services for the base bid of this project were completed by Bolton & Menk with design services for the alternates provided by CGA.



This project has multiple phases, each with their own completion dates / allowable construction windows:

Phase	Substantial Completion	SC Liquidated Damages	Final Completion	FC Liquidated Damages
Phase 1 – Center St	August 15, 2025	\$1,800 / Day	December 30, 2026	\$1,100 / Day
Phase 2 – Main St from Center to 1 st Ave	December 12, 2025	\$1,800 / Day	December 30, 2026	\$1,100 / Day
Phase 3.1 – Main St / 1 st Ave Intersection	60 Calendar Days in 2026	\$1,800 / Day	December 30, 2026	\$1,100 / Day
Phase 3.2 – Main St from 1 st Ave to 3 rd Ave	December 11, 2026	\$2,000 / Day	December 30, 2026	\$1,100 / Day
Bid Alternate 1 & 2 – Parking Lot & Alley	45 Calendar Days in fall 2025 or 2026	<i>Not clearly specified</i>	December 30, 2026	\$1,100 / Day

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff, Mark Mitchell,
Greg Nichols, Jeff Schneider, Gary Thompson



The bid timeline is as follows:

- Ordering construction at the February 10th, 2025 council meeting
- Public Hearing at the February 24th, 2025 council meeting
- Receiving/Opening Bids at 10:00 AM, Tuesday, March 4th, 2025 @ City Hall
- Awarding Bid at the March 10th, 2025 council meeting.

Attachments: Official Notice of Hearing & Letting, Plans, Project Manual, Opinion of Probable Cost

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CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff, Mark Mitchell,
Greg Nichols, Jeff Schneider, Gary Thompson



SECTION 00100 - NOTICE TO BIDDERS

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

Receipt and Opening of Sealed Proposals. Sealed proposals for the work comprising the repair or improvement as stated below must be filed before 10:00 A.M. on March 4, 2025, in the office of the Clerk, 24 N. Center Street, Marshalltown, Iowa 50158. Sealed proposals will be opened and publicly read with bids being tabulated at that time. The results will be reported to the City of Marshalltown at its meeting at 5:30 P.M. on March 10, 2025, at which time the Council may take action on the proposals submitted or at such time as may then be fixed. The City of Marshalltown Council reserves the right to reject any or all bids, to waive informalities or technicalities in any bid, and to enter into such contract, or contracts, as it shall deem to be in the best interest of the City of Marshalltown.

Time for Commencement and Completion of Work. Work on the improvement shall commence upon approval of the contract by the Council and as stated in the Notice to Proceed. All work under the contract must be complete on or before December 11, 2026. Liquidated damages are as set forth in Section 00500 – Contract. Interim completion dates shall apply as well based on Section 00500 - Contract

Bid Security. Each Bidder shall accompany its bid with bid security, as defined in Iowa Code Section 26.8, as security that the successful Bidder will enter into a contract for the work bid upon. The Bidder's security shall be in an amount equal to 5 percent of the total amount of the bid. The bid shall contain no condition except as provided in the specifications. If the Bidder fails to execute the contract and to furnish an acceptable Performance, Payment, and Maintenance Bond or provide a Certificate of Insurance within ten (10) days after acceptance of the bid by the City, the bid security may be forfeited or cashed by the City as liquidated damages.

Contract Documents. Copies of the project documents are available for a price of \$25.00 per set. This fee is refundable, provided the plans and specifications are returned complete and in reusable condition, and they are returned within fourteen (14) calendar days after the award of the project. Please make your check payable to Bolton & Menk, Inc. and send it to 1519 Baltimore Drive, Ames, Iowa 50010. Complete digital project bidding documents are available at www.bolton-menk.com or www.questcdn.com. You may view the digital plan documents for free by entering QuestCDN Project # Quest No. is 9512323 on the website's Project Search page. Documents may be downloaded for \$0.00. Please contact QuestCDN.com at 952-233-1632 or info@questcdn.com for assistance in free membership registration, viewing, downloading, and working with this digital project information.

Preference of Products and Labor. By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa, to the extent lawfully required under Iowa statutes.

Sales Tax Exemption Certificates. The Bidder shall not include sales tax in the bid. The City of Marshalltown will distribute tax exemption certificates and authorization letters to the contractor and all subcontractors who are identified. The contractor and subcontractor may make copies of the tax exemption certificates and provide a copy to each supplier providing construction materials. These tax exemption certificates and authorization letters are applicable only for this specific project under the contract.

PROJECT DESCRIPTION: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center Street from State Street to Church Street.

The Notice is given by order of the Council of the City of Marshalltown.

Alicia Hunter
Clerk

SECTION 00110 - NOTICE OF PUBLIC HEARING

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

Public Hearing on Proposed Contract Documents and Estimated Costs for Repair or Improvement. A public hearing will be held by the City of Marshalltown on the proposed contract documents (plans, specifications and form of contract) and estimated cost for the improvement at its meeting at 5:30 P.M. on February 24, 2025, at 24 N. Center Street, Marshalltown, Iowa 50158.

PROJECT DESCRIPTION: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center Street from State Street to Church Street.

At said hearing, the Council will consider the plans, specifications, proposed form of contract, and estimated total cost for the project, the same now being on file in the office of the Clerk, 24 N. Center Street, Marshalltown, Iowa 50158, reference to which is made for a more detailed and complete description of the proposed improvements, and at said time and place the said Council will also receive and consider any objections to said plans, specifications, estimate of cost, and form of contract made by any interested party.

ENGINEER'S OPINION OF PROBABLE COSTS						
MSCD Welcome Center						
Bid Alternate #1: Parking Lot Reconstruction						
Marshalltown, Iowa						
ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	EXTENSION	
1001	Bollard	2	EA	\$1,250.00	\$2,500.00	
1002	Bollard, Decorative	1	EA	\$2,000.00	\$2,000.00	
1003	Cast Stone Seatwall 'A'	78	LF	\$300.00	\$23,400.00	
1004	Electrical Wiring and Conduit	1	LS	\$5,000.00	\$5,000.00	
1005	Handhole (HH-2)	1	EA	\$2,500.00	\$2,500.00	
1006	S4 Light Pole Assembly	2	EA	\$6,000.00	\$12,000.00	
1007	Light Pole Foundation	2	EA	\$2,000.00	\$4,000.00	
1008	Remove and Reinstall Street Sign	1	EA	\$100.00	\$100.00	
1009	Structural Soil (Tree Planting)	80	CY	\$280.00	\$22,400.00	
1010	Topsoil, Off-Site, 8 Inch	43	CY	\$70.00	\$3,010.00	
1011	Excavation, (Class 10)	1	LS	\$5,000.00	\$5,000.00	
1012	Subgrade Preparation, 12 Inch	1,550	SY	\$3.40	\$5,270.00	
1013	Subbase, (Modified), 4 Inches	135	SY	\$9.00	\$1,215.00	
1014	Subbase, (Modified), 6 Inches	1,550	SY	\$12.00	\$18,600.00	
1015	Storm Sewer, Trenched, RCP, 12 Inch	72	LF	\$90.00	\$6,480.00	
1016	Intake, Single Grate (SW-501)	1	EA	\$3,800.00	\$3,800.00	
1017	Pavement, PCC, 6 Inch	1,517	SY	\$50.00	\$75,850.00	
1019	Planter Curb	93	LF	\$50.00	\$4,650.00	
1020	Curb and Gutter, 30"x6"	47	LF	\$50.00	\$2,350.00	
1021	Removal of Sidewalk	216	SY	\$8.00	\$1,728.00	
1022	Removal of Driveway	20	SY	\$8.00	\$160.00	
1023	Sidewalk, PCC, 4 Inch	210	SY	\$50.00	\$10,500.00	
1024	Sidewalk Unit Pavers with Sand Setting Bed & PCC Base	145	SF	\$39.00	\$5,655.00	
1025	Detectable Warnings	20	SF	\$55.00	\$1,100.00	
1026	Driveway, Paved, PCC 8 Inch	33	SY	\$68.00	\$2,244.00	
1027	Pavement Removal	1789	SY	\$9.00	\$16,101.00	
1028	Curb and Gutter Removal	166	LF	\$12.00	\$1,992.00	
1029	Painted Pavement Markings, Solvent/Waterborne	7.8	STA	\$55.00	\$429.00	
1030	Painted Symbols and Legends	2	EA	\$1,000.00	\$2,000.00	
1031	Plants with Warranty, Deciduous Shrub	77	EA	\$100.00	\$7,700.00	
1032	Plants with Warranty, Deciduous Tree	12	EA	\$700.00	\$8,400.00	
1033	Rubber Mulch	20	CY	\$400.00	\$8,000.00	
1034	Wattle, Straw, 9 Inch	265	LF	\$3.50	\$927.50	
1035	Stabilized Construction Entrance	1	EA	\$3,000.00	\$3,000.00	
1036	Inlet Protection Device	1	EA	\$200.00	\$200.00	
1037	Mobilization	1	LS	\$13,500.00	\$13,500.00	
				Total	\$283,761.50	
				5% Contingencies	\$14,190.00	
TOTAL ESTIMATED CONSTRUCTION COST					\$297,951.50	

ENGINEER'S OPINION OF PROBABLE COSTS						
MSCD Welcome Center						
Bid Alternate #2: Alley Reconstruction						
Marshalltown, Iowa						
ITEM NO.	DESCRIPTION	QUANTITY		UNIT COST	EXTENSION	
1011	Excavation, (Class 10)	1	LS	\$2,000.00	\$2,000.00	
1012	Subgrade Preparation, 12 Inch	373	SY	\$3.40	\$1,268.20	
1013	Subbase, (Modified), 4 Inches	21	SY	\$9.00	\$189.00	
1014	Subbase, (Modified), 6 Inches	373	SY	\$12.00	\$4,476.00	
1018	Pavement, PCC, 8 Inch	348	SY	\$77.00	\$26,796.00	
1021	Removal of Sidewalk	18	SY	\$8.00	\$144.00	
1022	Removal of Driveway	36	SY	\$8.00	\$288.00	
1023	Sidewalk, PCC, 4 Inch	21	SY	\$50.00	\$1,050.00	
1025	Detectable Warnings	20	SF	\$55.00	\$1,100.00	
1026	Driveway, Paved, PCC 8 Inch	24	SY	\$68.00	\$1,632.00	
1027	Pavement Removal	336	SY	\$9.00	\$3,024.00	
1037	Mobilization	1	LS	\$2,100.00	\$2,100.00	
				TOTAL	\$44,067.20	
				5% Contingencies	\$2,210.00	
				TOTAL ESTIMATED CONSTRUCTION COST	\$46,277.20	

ENGINEER'S ESTIMATE
MAIN STREET RECONSTRUCTION
CITY OF MARSHALLTOWN
BMI PROJECT NO. 0A1.129221



February 5, 2025

Item		Total Est.			
No.	Item	Unit	Quantity	Unit Price	Total Amount
1	VAULT - DEMO VAULT TOP	SY	253	\$18.00	\$4,554.00
2	VAULT - DEMO STAIRS	SF	32	\$20.00	\$640.00
3	VAULT - INFILL OPENING, SINGLE WYTHE, 10 INCH	SF	17	\$105.00	\$1,785.00
4	VAULT - INFILL OPENING, SINGLE WYTHE, 12 INCH	SF	102	\$110.00	\$11,220.00
5	VAULT - INFILL OPENING, DOUBLE WYTHE, 24 INCH	SF	44	\$210.00	\$9,240.00
6	VAULT - WALL OPENING INFILL, 12" CMU	SF	66	\$150.00	\$9,900.00
7	VAULT - WALL OPENING INFILL, CONCRETE	CF	30	\$6.00	\$180.00
8	VAULT - CMU BLOCK WALL, 12 INCH	SF	143	\$100.00	\$14,300.00
9	VAULT - CAST IN PLACE WALL AND DOOR INFILL	CY	4.6	\$150.00	\$690.00
10	VAULT - WALL FOOTING UNDER NEW WALL	CY	7.4	\$150.00	\$1,110.00
11	VAULT - WATERPROOF WALL	SF	1255	\$70.00	\$87,850.00
12	VAULT - DRILLING HOLES IN CONCRETE FLOOR	EA	59	\$100.00	\$5,900.00
13	VAULT - GRANULAR FILL	CY	486	\$50.00	\$24,300.00
14	VAULT - STAIR REPLACEMENT	EA	2	\$1,500.00	\$3,000.00
15	VAULT - STRUCTURAL SIDEWALK	SY	5.6	\$330.00	\$1,848.00
16	COLLAPSIBLE BOLLARD	EA	4	\$2,000.00	\$8,000.00
17	BOLLARD	EA	1	\$1,250.00	\$1,250.00
18	GATEWAY MONUMENT ARCH	LS	1	\$225,000.00	\$225,000.00
19	BENCH (FURNISH AND INSTALL)	EA	3	\$3,000.00	\$9,000.00
20	BENCH (INSTALL ONLY)	EA	3	\$300.00	\$900.00
21	LITTER RECEPTACLE (INSTALL ONLY)	EA	9	\$250.00	\$2,250.00
22	BIKE RACK (INSTALL ONLY)	EA	3	\$300.00	\$900.00
23	FLAG POLE	EA	2	\$8,500.00	\$17,000.00
24	PLANTER POT, 36" X 36"	EA	10	\$2,500.00	\$25,000.00
25	PLANTER POT, 42" X 42"	EA	10	\$2,500.00	\$25,000.00
26	STANDING HEIGHT TABLE	EA	5	\$4,000.00	\$20,000.00
27	CAST STONE SEATWALL TYPE 'A'	LF	60	\$300.00	\$18,000.00
28	CAST STONE SEATWALL TYPE 'B'	LF	152	\$400.00	\$60,800.00
29	ELECTRICAL WIRING, CONDUIT, AND DISTRIBUTION PEDESTALS	LS	1	\$190,000.00	\$190,000.00
30	HANDHOLE (HH-1 AND HH-2)	EA	13	\$2,500.00	\$32,500.00
31	HANDHOLE (HH-3)	EA	1	\$2,500.00	\$2,500.00
32	TYPE S1, S1A, S1B LIGHT POLE ASSEMBLY	EA	25	\$9,000.00	\$225,000.00
33	TYPE S2A, S2B, S2C, S2D LIGHT POLE ASSEMBLY	EA	8	\$8,500.00	\$68,000.00
34	TYPE S2 LIGHT POLE ASSEMBLY	EA	16	\$7,100.00	\$113,600.00
35	TYPE S3 LIGHT POLE ASSEMBLY	EA	8	\$3,600.00	\$28,800.00
36	TYPE S3C, S3D LIGHT POLE ASSEMBLY	EA	2	\$3,600.00	\$7,200.00
37	TYPE S4 LIGHT POLE ASSEMBLY	EA	2	\$6,000.00	\$12,000.00
38	TYPE S3F CATENARY LIGHTING ASSEMBLY	LS	1	\$48,000.00	\$48,000.00
39	LIGHT POLE FOUNDATION	EA	61	\$2,000.00	\$122,000.00
40	EVENT POWER PEDESTAL (PED-1)	EA	2	\$2,500.00	\$5,000.00
41	TREE PROTECTION	EA	6	\$500.00	\$3,000.00
42	REMOVE AND REINSTALL LINCOLN HIGHWAY MARKER	EA	1	\$1,500.00	\$1,500.00
43	CONCRETE PLANTING BED EDGE	LF	75	\$50.00	\$3,750.00
44	CLEARING AND GRUBBING	LS	1	\$5,000.00	\$5,000.00
45	AMENDED PLANTING SOIL	CY	277	\$175.00	\$48,475.00
46	TOPSOIL, OFF-SITE, 8 INCH	CY	375	\$70.00	\$26,250.00
47	STRUCTURAL SOIL (TREE PLANTING)	CY	722	\$280.00	\$202,160.00
48	EXCAVATION, CLASS 13	CY	5350	\$25.00	\$133,750.00

49	SUBGRADE PREPARATION, 12 INCH	SY	13345	\$3.40	\$45,373.00
50	GRANULAR STABILIZATION	TON	1220	\$60.00	\$73,200.00
51	SUBGRADE TREATMENT, MULTIAXIAL GEO-GRID	SY	13345	\$4.75	\$63,388.75
52	SUBBASE, MODIFIED, 4 INCHES	SY	8063	\$9.00	\$72,567.00
53	SUBBASE, MODIFIED, 6 INCHES	SY	253	\$12.00	\$3,036.00
54	SUBBASE, MODIFIED, 8 INCHES	SY	13345	\$16.00	\$213,520.00
55	REMOVAL OF STRUCTURE, ELECTRICAL METER	EA	2	\$2,000.00	\$4,000.00
56	REMOVAL OF STRUCTURE, LIGHT POLE FOOTING	EA	34	\$600.00	\$20,400.00
57	REMOVAL OF STRUCTURE, HANDHOLE	EA		\$400.00	
58	REMOVAL OF STRUCTURE, FLAG POLE	EA	2	\$600.00	\$1,200.00
59	REMOVAL OF STRUCTURE, MISC. SITE FURNISHINGS	LS	1	\$5,000.00	\$5,000.00
60	TROLLEY TRACK REMOVAL	LF	1400	\$75.00	\$105,000.00
61	COMPACTION TESTING	LS	1	\$15,000.00	\$15,000.00
62	EXPLORATORY EXCAVATION	HR	40	\$350.00	\$14,000.00
63	TRENCH FOUNDATION	TON	200	\$65.00	\$13,000.00
64	REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL	CY	400	\$40.00	\$16,000.00
65	TRENCH COMPACTION TESTING	LS	1	\$15,000.00	\$15,000.00
66	DISPOSAL OF CONTAMINATED SOIL	TON	991	\$90.00	\$89,190.00
67	DISPOSAL OF CONTAMINATED GROUND WATER	GAL	500	\$8.00	\$4,000.00
68	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$500.00	\$500.00
69	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$1,500.00	\$1,500.00
70	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$800.00	\$800.00
71	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$1,900.00	\$1,900.00
72	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$1,000.00	\$1,000.00
73	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$2,300.00	\$2,300.00
74	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$1,200.00	\$1,200.00
75	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$2,600.00	\$2,600.00
76	STORM SEWER, TRENCHED, PVC, 10 INCH	LF	92	\$80.00	\$7,360.00
77	STORM SEWER, TRENCHED, PVC, 12 INCH	LF	150	\$90.00	\$13,500.00
78	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	1341	\$100.00	\$134,100.00
79	STORM SEWER, TRENCHED, RCP, 24 INCH	LF	444	\$120.00	\$53,280.00
80	STORM SEWER, TRENCHED, RCP, 36 INCH	LF	502	\$175.00	\$87,850.00
81	REMOVAL OF STORM SEWER, 36 INCH OR LESS	LF	1047	\$15.00	\$15,705.00
82	SUBDRAIN, TYPE 1C, PVC, 6 INCH	LF	1984	\$20.00	\$39,680.00
83	SUBDRAIN CLEANOUT, TYPE A-1, 6 INCH	EA	2	\$1,200.00	\$2,400.00
84	SUBDRAIN OUTLETS AND CONNECTIONS	EA	30	\$600.00	\$18,000.00
85	WATER MAIN, TRENCHED, DIP WITH NITRILE GASKETS, 8 INCH	LF	2553	\$105.00	\$268,065.00
86	FITTING, DUCTILE IRON	LB.	3983	\$24.00	\$95,592.00
87	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, SHORT SIDE	EA	1	\$3,500.00	\$3,500.00
88	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, LONG SIDE	EA	2	\$6,800.00	\$13,600.00
89	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	5	\$3,500.00	\$17,500.00
90	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, LONG SIDE	EA	4	\$7,100.00	\$28,400.00
91	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	5	\$3,200.00	\$16,000.00
92	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, SHORT SIDE	EA	2	\$7,200.00	\$14,400.00
93	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, LONG SIDE	EA	2	\$7,200.00	\$14,400.00
94	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	6	\$9,000.00	\$54,000.00
95	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, LONG SIDE	EA	3	\$13,000.00	\$39,000.00
96	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, SHORT SIDE	EA	4	\$10,000.00	\$40,000.00
97	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, LONG SIDE	EA	1	\$14,000.00	\$14,000.00
98	WATER SERVICE PIPE, COPPER, 3/4 INCH, SHORT SIDE	EA	7	\$1,200.00	\$8,400.00
99	WATER SERVICE PIPE, COPPER, 3/4 INCH, LONG SIDE	EA	5	\$3,000.00	\$15,000.00
100	WATER SERVICE PIPE, COPPER, 1 INCH, SHORT SIDE	EA	9	\$1,400.00	\$12,600.00
101	WATER SERVICE PIPE, COPPER, 1 INCH, LONG SIDE	EA	3	\$3,200.00	\$9,600.00
102	WATER SERVICE PIPE, COPPER, 1 1/4 INCH, SHORT SIDE	EA	3	\$1,600.00	\$4,800.00
103	WATER SERVICE PIPE, COPPER, 1 1/4 INCH, LONG SIDE	EA	1	\$3,400.00	\$3,400.00

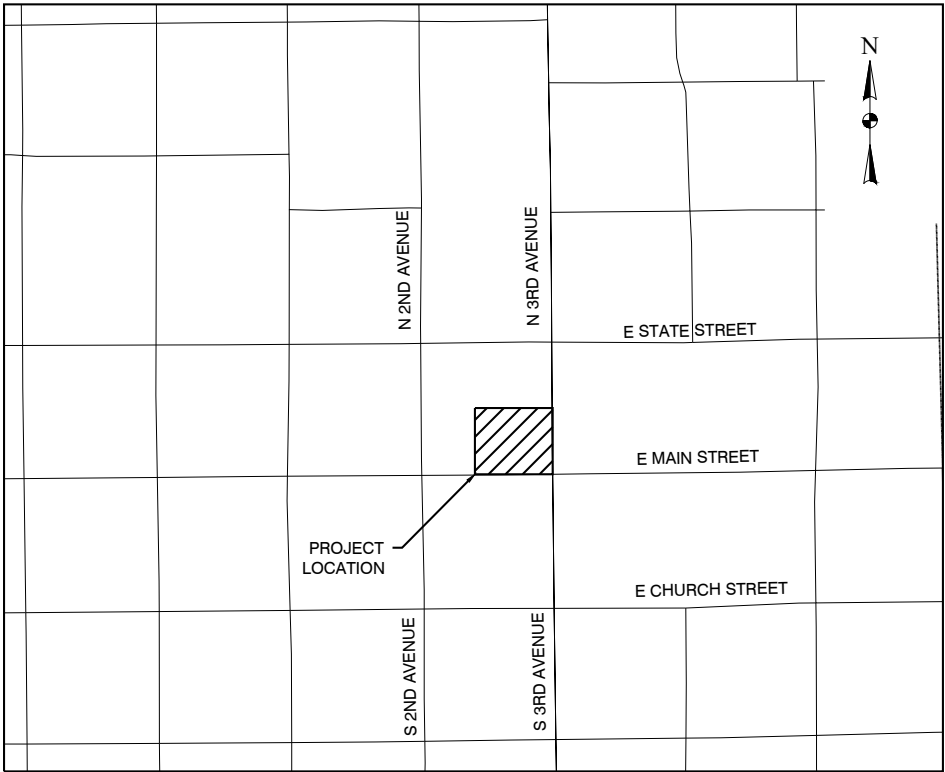
104	WATER SERVICE PIPE, COPPER, 1 1/2 INCH, SHORT SIDE	EA	1	\$1,800.00	\$1,800.00
105	WATER SERVICE PIPE, COPPER, 1 1/2 INCH, LONG SIDE	EA	1	\$3,600.00	\$3,600.00
106	WATER SERVICE PIPE, COPPER, 1 3/4 INCH, SHORT SIDE	EA	1	\$3,900.00	\$3,900.00
107	WATER SERVICE PIPE, COPPER, 1 3/4 INCH, LONG SIDE	EA	2	\$3,900.00	\$7,800.00
108	WATER SERVICE PIPE, COPPER, 2 INCH, SHORT SIDE	EA	3	\$2,100.00	\$6,300.00
109	WATER SERVICE PIPE, COPPER, 2 INCH, LONG SIDE	EA	1	\$4,200.00	\$4,200.00
110	WATER SERVICE PIPE, COPPER, 2 1/2 INCH, SHORT SIDE	EA	1	\$2,300.00	\$2,300.00
111	WATER SERVICE PIPE, COPPER, 2 1/2 INCH, LONG SIDE	EA	1	\$4,500.00	\$4,500.00
112	WATER SERVICE CURB STOP AND BOX	EA	38	\$1,100.00	\$41,800.00
113	WATER MAIN REMOVAL	LF	2388	\$20.00	\$47,760.00
114	VALVE, GATE, 4 INCH, FIRE SERVICE	EA	2	\$2,800.00	\$5,600.00
115	VALVE, GATE, 6 INCH, FIRE SERVICE	EA	30	\$3,500.00	\$105,000.00
116	VALVE, GATE, 8 INCH	EA	12	\$3,500.00	\$42,000.00
117	INSERTION VALVE, 6 INCH	EA	2	\$14,000.00	\$28,000.00
118	INSERTION VALVE, 8 INCH	EA	2	\$19,000.00	\$38,000.00
119	LINE STOP, 8 INCH	EA	4	\$6,000.00	\$24,000.00
120	LINE STOP, 10 INCH	EA	1	\$7,000.00	\$7,000.00
121	FIRE HYDRANT ASSEMBLY	EA	8	\$7,300.00	\$58,400.00
122	FLUSHING DEVICE (TEMPORARY BLOWOFF DEVICE)	EA	12	\$2,300.00	\$27,600.00
123	FIRE HYDRANT ASSEMBLY REMOVAL	EA	4	\$1,800.00	\$7,200.00
124	VALVE REMOVAL	EA	22	\$750.00	\$16,500.00
125	STORM MANHOLE, SW-401, 48 INCH	EA	1	\$6,000.00	\$6,000.00
126	STORM MANHOLE, SW-401, 84 INCH	EA	1	\$14,000.00	\$14,000.00
127	INTAKE, SW-501	EA	6	\$3,800.00	\$22,800.00
128	INTAKE, SW-503	EA	1	\$4,900.00	\$4,900.00
129	INTAKE, SW-505	EA	14	\$6,200.00	\$86,800.00
130	INTAKE, SW-506	EA	4	\$7,900.00	\$31,600.00
131	INTAKE, SW-507	EA	3	\$6,800.00	\$20,400.00
132	INTAKE, SW-541, MODIFIED	EA	3	\$13,000.00	\$39,000.00
133	MANHOLE ADJUSTMENT, MINOR	EA	1	\$3,200.00	\$3,200.00
134	CONNECTION TO EXISTING MANHOLE	EA		\$3,200.00	
135	REMOVE MANHOLE	EA	8	\$1,200.00	\$9,600.00
136	REMOVE INTAKE	EA	16	\$900.00	\$14,400.00
137	PAVEMENT, PCC, 8 INCH, C4WRC20	SY	11778	\$77.00	\$906,906.00
138	PLANTER CURB	LF	2433	\$50.00	\$121,650.00
139	PCC PAVEMENT SAMPLES AND TESTING	LS	1	\$10,000.00	\$10,000.00
140	REMOVAL OF SIDEWALK	SY	6738	\$8.00	\$53,904.00
141	REMOVAL OF DRIVEWAY	SY	405	\$8.00	\$3,240.00
142	SIDEWALK, PCC, 5 INCH	SY	5463	\$63.00	\$344,169.00
143	SIDEWALK, PCC, 6 INCH	SY	494	\$70.00	\$34,580.00
144	CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE	SF	3001	\$42.00	\$126,042.00
145	ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE	SF	2294	\$42.00	\$96,348.00
146	SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE	SF	12679	\$39.00	\$494,481.00
147	DETECTABLE WARNING	SF	453	\$55.00	\$24,915.00
148	DRIVEWAY, PAVED, PCC, 7 INCH	SY	152	\$60.00	\$9,120.00
149	DRIVEWAY, PAVED, PCC, 8 INCH (ALLEY)	SY	168	\$68.00	\$11,424.00
150	SIDEWALK ASSURANCE TESTING	LS	1	\$10,000.00	\$10,000.00
151	DRIVEWAY ASSURANCE TESTING	LS	1	\$5,000.00	\$5,000.00
152	PAVEMENT REMOVAL	SY	12700	\$9.00	\$114,300.00
153	PAINTED PAVEMENT MARKINGS, SOLVENT/WATERBORNE	STA	150	\$55.00	\$8,250.00
154	PAINTED SYMBOLS AND LEGENDS	EA	8	\$1,000.00	\$8,000.00
155	TEMPORARY TRAFFIC CONTROL	LS	1	\$40,000.00	\$40,000.00
156	TEMPORARY TRAFFIC CONTROL - PEDESTRIAN ACCESS	LS	1	\$20,000.00	\$20,000.00
157	REMOVE AND SALVAGE TRAFFIC SIGN ASSEMBLY	EA	42	\$50.00	\$2,100.00
158	SOD	SQ	139	\$85.00	\$11,815.00
159	PLANTS WITH WARRANTY, DECIDUOUS SHRUB, (#5 CONT)	EA	21	\$100.00	\$2,100.00

160	PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL)	EA	2516	\$27.00	\$67,932.00
161	PLANTS WITH WARRANTY, DECIDUOUS TREE	EA	54	\$700.00	\$37,800.00
162	RUBBER MULCH	CY	46	\$400.00	\$18,400.00
163	IRRIGATION SYSTEM	LS	1	\$150,000.00	\$150,000.00
164	SWPPP PREPARATION	LS	1	\$2,000.00	\$2,000.00
165	SWPPP MANAGEMENT	LS	1	\$15,000.00	\$15,000.00
166	WATTLE, STRAW, 9 INCH	LF	2800	\$3.50	\$9,800.00
167	STABILIZED CONSTRUCTION ENTRANCE	EA	1	\$3,000.00	\$3,000.00
168	INLET PROTECTION DEVICE	EA	58	\$200.00	\$11,600.00
169	CONSTRUCTION SURVEY	LS	1	\$102,000.00	\$102,000.00
170	MONUMENT PRESERVATION AND REPLACEMENT	LS	1	\$5,000.00	\$5,000.00
171	MOBILIZATION	LS	1	\$589,000.00	\$589,000.00
172	MAINTENANCE OF POSTAL SERVICE	LS	1	\$5,000.00	\$5,000.00
173	TEMPORARY GRANULAR SIDEWALK	SY	400	\$22.00	\$8,800.00
174	TEMPORARY LONGITUDINAL CHANNELIZING DEVICE	LF	4430	\$6.00	\$26,580.00
175	CONCRETE WASHOUT	LS	1	\$6,000.00	\$6,000.00

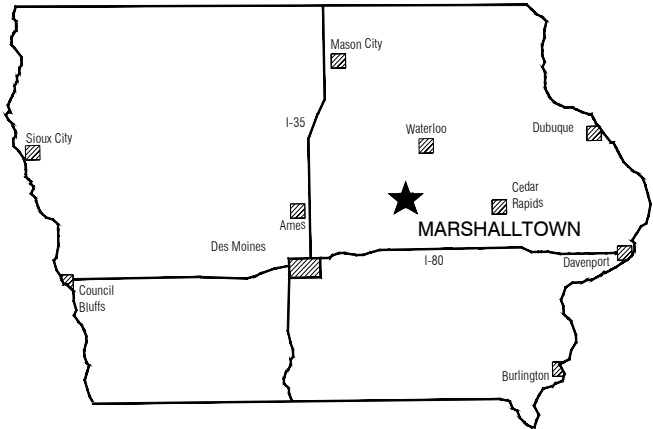
OPINION OF PROBABLE CONSTRUCTION COST:

\$7,949,124.75

MCSO WELCOME CENTER PARKING LOT RECONSTRUCTION MARSHALLTOWN, IOWA ~2025~



VICINITY MAP
NOT TO SCALE



LOCATION MAP

WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH
THE IOWA STATEWIDE URBAN STANDARD
SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, CURRENT
EDITION (SUDAS) AND THE CITY OF MARSHALLTOWN
STANDARD SPECIFICATIONS

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
C.100	TITLE SHEET
C.101	SYMBOLS, LEGEND AND GENERAL INFORMATION
C.102-C.104	QUANTITIES AND REFERENCE INFORMATION
C.110	EXISTING CONDITIONS AND DEMOLITION PLAN
C.200	LAYOUT PLAN
C.210	UTILITY PLAN
C.300	GRADING PLAN & SWPPP
C.400	LANDSCAPE PLAN
C.500-C.501	DETAILS



Clapsaddle-Garber Associates, Inc
16 East Main Street, P.O. Box 754
Marshalltown, Iowa 50158
Phone 641-752-6701
www.cgaconsultants.com

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Adam C. Daters 02-03-2025
Signature Date
Adam C. Daters, PE
Iowa License Number 19579
My license renewal date is December 31, 2026

Pages or sheets covered by this seal: ALL SHEETS LISTED IN INDEX ON THIS SHEET

LEGEND

EXISTING	PROPOSED		EXISTING	PROPOSED	
		EVERGREEN TREE			WATERLINE
		DECIDUOUS TREE			WATER VALVE
		FRUIT TREE			FIRE HYDRANT
		SHRUBS (BUSHES)			WATER METER
		TREE LINE			CURB STOP
		STUMP			YARD HYDRANT
		SWAMP			FIRE DEPT. CONNECTION
		CEMETERY			POST INDICATOR VALVE
		GRAVE			SANITARY SEWER LINE
		CAVE			STORM SEWER LINE
		SINK HOLE			DRAIN TILE
		WELL			SUBDRAIN
		WINDMILL			MANHOLE
		CISTERN			CLEANOUT
		SEPTIC TANK			INTAKE
		LP GAS TANK			BEEHIVE INTAKE
		UNDERGROUND STORAGE TANK			ROOF DRAIN
		SATELLITE DISH			ROOF DRAIN (SURFACE)
		SIGN (TYPE AS NOTED)			ROOF DRAIN (UNDERGROUND)
		FLAGPOLE			GAS LINE
		SOIL BORING			GAS VALVE
		MONITORING WELL			GAS METER
		PARKING METER			OVERHEAD ELECTRICAL LINE
		MAILBOX			BURIED ELECTRICAL LINE
		POST			POWER POLE
		BOLLARD			ELECTRICAL METER
		SPRINKLER HEAD			ELECTRICAL HIGHLINE TOWER
		SPRINKLER HEAD VALVE			TRAFFIC SIGNAL
		GUARDRAIL (BEAM OR CABLE)			STREET LIGHT
		FENCE			LUMINAIRE
		TILE OUTLET			ELECTRICAL BOX/TRANSFORMER
		DRAINAGE WAY			FIBER OPTICS LINE
		EDGE OF WATER			FIBER OPTICS BOX
		SILT FENCE			FIBER PEDESTAL
		CONTOUR LINE			TELEPHONE LINE
		SPOT ELEVATION			TELEPHONE POLE
		BUILDING			TELEPHONE PEDESTAL
					TELEPHONE BOX
					CABLE TELEVISION LINE
					TELEVISION BOX
					AIR CONDITIONER



EXISTING	PROPOSED	
		SECTION/R.O.W. LINE
		BOUNDARY LINE
		PROPERTY LINE
		EASEMENT LINE
		SETBACK LINE
		R.O.W. RAIL OR LOT CORNER
		CONCRETE MONUMENT
		GOVERNMENT CORNER MONUMENT
		PARCEL OR LOT CORNER MONUMENT
		TEMP. CONSTRUCTION EASEMENT CORNER
		SURVEY CONTROL POINT

ABBREVIATIONS	
PCC	PORTLAND CEMENT CONCRETE
ACC	ASPHALT CEMENT CONCRETE
STM	STORM SEWER MANHOLE
INT	STORM SEWER INTAKE
INT-MH	STORM SEWER INTAKE WITH MANHOLE
STCO	STORM SEWER CLEANOUT
FES	STORM SEWER FLARED END SECTION
STP	STORM SEWER PIPE
STFM	STORM SEWER FORCE MAIN
SMH	SANITARY SEWER MANHOLE
SACO	SANITARY SEWER CLEANOUT
SAP	SANITARY SEWER PIPE
SAFM	SANITARY SEWER FORCE MAIN
FH	FIRE HYDRANT ASSEMBLY
YH	YARD HYDRANT ASSEMBLY
WV	WATER VALVE
CS	CURB STOP
PIV	POST INDICATOR VALVE
FDC	FIRE DEPT. CONNECTION
RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE
HDPE	HIGH-DENSITY POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
DI	DUCTILE IRON PIPE
CP	SURVEY CONTROL POINT
BM	SURVEY BENCHMARK
SB	SOIL BORING
MW	MONITORING WELL
PM	PARKING METER
SH	SPRINKLER HEAD
GV	GAS VALVE
GM	GAS METER
PP	POWER POLE
EM	ELECTRIC METER
TS	TRAFFIC SIGNAL
LP	LIGHT POLE/STREET LIGHT
EB	ELECTRICAL BOX/TRANSFORMER
FB	FIBER OPTICS BOX/PEDESTAL
TB	TELEPHONE BOX/PEDESTAL
TP	TELEPHONE POLE
CB	CABLE/TELEVISION BOX
AC	AIR CONDITIONER UNIT
CBU	CLUSTER MAILBOX UNIT

LEGAL DESCRIPTION

WARRANTY DEED: DOCUMENT NO. 202100021150
THE EAST HALF OF LOT 11 AND ALL OF LOT 12, BLOCK 12, IN THE TOWN OF MARSHALL,
MARSHALL COUNTY, IOWA

CONTROL POINTS:

IOWA REGIONAL COORDINATE SYSTEM ZONE 9 (NEWTON) NAD83(2011)(EPOCH 2010) IARTN
DERIVED -US SURVEY FEET

NUMBER	NORTHING	EASTING	ELEV.	DESCRIPTION
100	7855595.45	19475099.25	939.92	MAG NAIL SOUTH SIDEWALK
106	7855640.62	19475069.52	940.08	NAIL FRONT IN LOT FRONT OF BUILDING
107	7855679.52	19475070.29	940.16	NAIL FRONT IN LOT FRONT OF BUILDING

BENCHMARKS

NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV88-GEOID83A) IARTN DERIVED-US SURVEY
FEET

NUMBER	NORTHING	EASTING	ELEV.	DESCRIPTION
105	7855533.94	19478152.37	942.54	HYDRANT CAP BOLT S. SIDE 3RD AVE.

PROPOSED USE

EDUCATIONAL OFFICE SPACE AND MEETING
AREA, THEATER AND COFFEE SHOP

PROPERTY ADDRESS:

N 3RD AVENUE
MARSHALLTOWN, IOWA 50158

OWNER OF RECORD:

MARSHALLTOWN COMMUNITY SCHOOL DISTRICT
N 3RD AVENUE
MARSHALLTOWN, IOWA 50158

APPLICANT:

MARSHALLTOWN COMMUNITY SCHOOL DISTRICT
N 3RD AVENUE
MARSHALLTOWN, IOWA 50158

SURVEY PREPARED BY:

CLAPSADDLE-GARBER ASSOCIATES, INC
16 EAST MAIN STREET
MARSHALLTOWN, IOWA 50158
PH 641-752-6701
WWW.CGACONSULTANTS.COM

SITE PLAN PREPARED BY:

PROJECT MANAGER: ADAM DATERS
CLAPSADDLE-GARBER ASSOCIATES, INC
16 EAST MAIN STREET
MARSHALLTOWN, IOWA 50158
PH 641-752-6701
WWW.CGACONSULTANTS.COM

DATE OF PREPARATION:

02-03-2025

SUDAS REFERENCED DETAILS	
FIGURE NUMBER	NAME
3010.101	TRENCH BEDDING & BACKFILL ZONES
6010.603	CASTINGS FOR GRATE INTAKES
7010.101	JOINTS
7010.103	MANHOLE BOXOUTS IN PCC PAVEMENT
7030.201	CLASSES OF SIDEWALK
7030.204	GENERAL FEATURES OF AN ACCESSIBLE SIDEWALK
7030.207	CURB RAMP FOR CLASS B OR C SIDEWALK
7030.210	DETECTABLE WARNING PLACEMENT
9040.102	FILTER BERM & FILTER SOCK
9040.119	SILT FENCE
9040.120	STABILIZED CONSTRUCTION ENTRANCE

UTILITY COMPANIES

THE FOLLOWING UTILITIES ARE PRESENT ON THIS PROJECT

Alliant Energy Field Engineer	800-255-4268
Windstream Locate Desk	800-941-3430
CenturyLink Sadie Hull	918-547-0147
City of Marshalltown Electric David Deemer	641-754-5734
City of Marshalltown Sewer Troy McGahuey	641-754-5749
Marshalltown Water Works Zach Maxfield	641-753-7913
MediaCom Curt Hodges	515-669-3647
Heart of Iowa Ventures Jay Duncan	641-486-2211

NOTE:
TYPICAL DEPTH OF COVER ON WATERMAIN
PIPE IN MARSHALLTOWN IS 5.5 FT.

UNDERGROUND STRUCTURES, FACILITIES, AND UTILITIES
HAVE BEEN PLATTED FROM AVAILABLE SURVEYS, RECORDS
AND DEEDS. THEREFORE THEIR LOCATIONS MUST BE
CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS,
THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN.

NOTES:

- ALL BEARINGS ARE THE RESULT OF G.P.S.
OBSERVATIONS.
- ALL UNDERGROUND UTILITIES ON THIS SITE HAVE BEEN LOCATED AT ASCE
LEVEL C OR D SURVEY QUALITY.
- UTILITY LINETYPES WITH A QUALITY LEVEL INDICATOR (*) HAVE BEEN
LOCATED PER THE FOLLOWING ASCE STANDARD GUIDELINE FOR THE
COLLECTION & DEPICTION OF EXISTING SUBSURFACE UTILITY DATA* :

(A) - PRECISE HORIZONTAL & VERTICAL LOCATION OF UTILITIES OBTAINED BY THE
ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED & SURVEYED
UTILITIES) & SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES,
USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION
EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY
DAMAGE. A PRECISE HORIZONTAL & VERTICAL LOCATION, AS WELL AS OTHER
UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS
TYPICALLY SET TO 15- MM VERTICAL & TO APPLICABLE HORIZONTAL SURVEY &
MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

(B) - INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE
SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE &
APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY
LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY
POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE
TOLERANCES DEFINED BY THE PROJECT & REDUCED ONTO PLAN
DOCUMENTS.

(C) - INFORMATION OBTAINED BY SURVEYING & PLOTTING VISIBLE
ABOVE-GROUND UTILITY FEATURES & BY USING PROFESSIONAL JUDGEMENT
IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

(D) - INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

FIELD WORK COMPLETED:

11-22-2023

Zoning Compliance Summary (Based upon Chapter 156, Zoning Regulations of the City of Marshalltown, County of Marshall, State of Iowa, in current usage)			
CRITERION	REQUIRED/PERMITTED	PROPOSED	PRIMARY CODE REFERENCE
Applicable Zoning District	Urban Core Historic District Overlay		Zoning Map & FIRM
Principal Permitted Use	All Other Educational Facilities	EDUCATIONAL OFFICE SPACE AND MEETING AREA, THEATER AND COFFEE SHOP	156.E.004
Minimum Lot Area in Square Feet	N/A	16,406 SF	156.B.005-1
Minimum Lot Frontage in Feet	N/A	0 Ft	156.B.005-1
Minimum Front Lot Line	0 FT/5 FT	0 Ft	156.B.005-1
Minimum Side Lot Line	0 FT	0 Ft	156.B.005-1
Minimum Rear Lot Line	0 Ft	0 Ft	156.B.005-1
Minimum Landscape Area in Percent	5%	1,745 SF 10.63%	156.B.005-1
Parking Allowed Between Buildings & Streets	N/A	YES	156.E.004
Parking Spaces Required	1 per 350 SF GFA Total GFA = 16,203 46 Maximum Spaces	27 Spaces	156.E.004

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE

Clapsaddle-Garber Associates, Inc
16 East Main Street
Marshalltown, Iowa 50158
Ph 641-752-6701
www.cgaconsultants.com

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CHECKED: ---	DATE: ---
APPROVED: ---	DATE: ---

MCS D WELCOME CENTER
MARSHALLTOWN, IOWA

SYMBOLS, LEGEND, AND
GENERAL INFORMATION

PROJECT NO. 23-DS-0454
SHEET NO. C.101

J:\23-DS-0454\dwg\5_Sheets\23DS0454-C.102 (Quantities).dwg - C.102 - 02-05-25 - 9:38am - rhageman

MCSD WELCOME CENTER PARKING LOT RECONSTRUCTION BID ALTERNATE #1: PARKING LOT RECONSTRUCTION BID ALTERNATE #2: ALLEY RECONSTRUCTION							
ESTIMATE OF QUANTITIES							
ITEM NO.	RELATED MAIN ST. RECONSTRUCTION BID ITEM NO. (FOR INFORMATION ONLY)	ITEM CODE	ITEM DESCRIPTION	UNIT	BID ALT #1	BID ALT #2	AS-BUILT QUANTITY
1001	17	0000-999-P	BOLLARD	EA	2		
1002			BOLLARD, DECORATIVE	EA	1		
1003	27	0000-999-X	CAST STONE SEATWALL 'A'	LF	78		
1004			ELECTRICAL WIRING AND CONDUIT	LS	1		
1005	30	0000-999-AA	HANDHOLE (HH2)	EA	1		
1006	37	0000-999-AE	S4 LIGHT POLE ASSEMBLY	EA	2		
1007	39	0000-999-AG	LIGHT POLE FOUNDATION	EA	2		
1008			REMOVE AND REINSTALL STREET SIGN	EA	1		
1009	46	2010-D-3	TOPSOIL, OFF-SITE, 8 INCH	CY	80		
1010	47	2010-D-4	STRUCTURAL SOIL (TREE PLANTING)	CY	43		
1011		2010-E	EXCAVATION, (CLASS 10)	LS	1	1	
1012	49	2010-D-4	SUBGRADE PREPARATION, 12 INCH	SY	1550	373	
1013	52	2010-J	SUBBASE, MODIFIED, 4 INCHES	SY	135	21	
1014	53	2010-J	SUBBASE, MODIFIED, 6 INCHES	SY	1550	373	
1015		4020-A-1	STORM SEWER, TRENCHED, RCP, 12 INCH	LF	72		
1016	124	6010-B	INTAKE, SINGLE GRATE (SW-501)	EA	1		
1017		7010-A	PAVEMENT, PCC, 6 INCH	SY	1517		
1018		7010-A	PAVEMENT, PCC, 8 INCH	SY		348	
1019	135	7010-F	PLANTER CURB	LF	93		
1020		7010-E	CURB AND GUTTER, 30"x6"	LF	47		
1021	137	7030-A-1	REMOVAL OF SIDEWALK	SY	216	18	
1022	138	7030-A-3	REMOVAL OF DRIVEWAY	SY	20	36	
1023		7030-E	SIDEWALK, PCC, 4 INCH	SY	210	21	
1024	143	7030-F	SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE	SF	145		
1025	144	7030-G	DETECTABLE WARNING	SF	20	20	
1026	146	7030-I	DRIVEWAY, PAVED, PCC 8 INCH	SY	33	24	
1027	149	7040-H	PAVEMENT REMOVAL	SY	1789	336	
1028		7040-I	CURB AND GUTTER REMOVAL	LF	166		
1029	150	8020-B	PAINT PAVEMENT MARKINGS, SOLVENT/WATERBORNE	STA	7.8		
1030	151	8020-G	PAINTED SYMBOLS AND LEGENDS	EA	2		
1031	156	9030-B	PLANTS WITH WARRANTY, DECIDUOUS SHRUBS (#5 CONT)	EA	77		
1032	158	9030-B	PLANTS WITH WARRANTY, DECIDUOUS TREE	EA	12		
1033	159	9033-999-A	RUBBER MULCH	CY	20		
1024	163	9040-F-1	WATTLE, STRAW, 9 INCH	LF	265		
1025	164	9040-O-1	STABILIZED CONSTRUCTION ENTRANCE	EA	1		
1036	165	9040-T-1	INLET PROTECTION DEVICE	EA	1		
1037	168	11020-A	MOBILIZATION	LS	1	1	

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MCSD WELCOME CENTER
MARSHALLTOWN, IOWA

QUANTITIES

PROJECT NO. 23-DS-0454
SHEET NO. C.102

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ESTIMATE REFERENCE INFORMATION			
ITEM NO.	RELATED MAIN ST. RECONSTRUCTION BID ITEM NO. (FOR INFORMATION ONLY)	ITEM CODE	DESCRIPTION
1001	17	0000-999-P	BOLLARD: A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL BOLLARD. SEE SHEET C.200 FOR LOCATION AND SHEET C.501 FOR DETAILS. B. ITEM IS TO BE PAID PER EACH.
1002			BOLLARD, DECORATIVE: A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL WAUSAU TILE TF6101 CONCRETE SPHERE BOLLARD OR APPROVED EQUIVALENT. SEE SHEET C.200 FOR LOCATION.
1003	27	0000-999-X	CAST STONE SEATWALL 'A': A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH MATERIALS AND CONSTRUCT CAST STONE SEATWALL TYPE 'A'. B. SEE SHEET C.200 FOR LOCATIONS AND C.501 FOR DETAILS. C. ITEM IS TO BE MEASURED AND PAID FOR ON A LINEAR FOOT BASIS OF CAST STONE SEATWALL TYPE 'A' CONSTRUCTED. D. ALL ITEMS NECESSARY FOR COMPLETE PROCUREMENT AND INSTALLATION OF CAST STONE, SEALING OF JOINTS, AND BACKFILLING REQUIRED FOR COMPLETE CONSTRUCTION OF THE WALLS AS RECOMMENDED BY THE MANUFACTURER. EXCAVATION, FOOTINGS, REINFORCEMENT, AND MODIFIED SUBBASE ARE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ALL COMPONENTS.
1004			ELECTRICAL WIRING AND CONDUIT: THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE CONDUIT AND WIRE. SEE SHEET C.210 FOR DETAILS.
1005	30	0000-999-AA	HANDHOLE (HH-2): THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE HANDHOLES (HH-1 AND HH-2). SEE SHEET C.210 FOR LOCATIONS AND DETAILS.
1006		0000-999-AE	S4 LIGHT POLE ASSEMBLY: THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S4 LIGHT POLE ASSEMBLIES. SEE SHEET C.210 FOR LOCATIONS AND DETAILS.
1007	39	0000-999-AG	LIGHT POLE FOUNDATION: THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL LIGHT POLE FOUNDATIONS. SEE SHEET C.210 FOR DETAILS.
1008			REMOVE AND REINSTALL STREET SIGN: A. THIS ITEM INCLUDES THE REMOVAL, STORAGE, AND REINSTALLATION OF STREET SIGN. INSTALLATION LOCATION TO BE VERIFIED WITH ENGINEER.
1009	46	2010-D-3	TOPSOIL, OFF-SITE, 8 INCH: A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING, HAULING AND SPREADING TOPSOIL. B. PAYMENT WILL BE BASED ON CONTRACT QUANTITY. QUANTITY IS BASED ON PLACING A MINIMUM 8" DEPTH OF TOPSOIL ON ALL AREAS THAT ARE DISTURBED. QUANTITY IS FOR MATERIAL IN PLACE (SHRINKAGE NOT INCLUDED)
1010	47	2010-D-4	STRUCTURAL SOIL (TREE PLANTING): A. THIS ITEM INCLUDES OVER-EXCAVATION AS WELL AS FURNISHING, MIXING, PLACEMENT, AND LEVELING OF THE STRUCTURAL SOIL. B. STRUCTURAL SOIL SHALL BE MEASURED BY CY INSTALLED. C. LOCATIONS ARE SHOWN ON THE SHEET C.400, SEE C.501 FOR DETAILS. MUST BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT BY THE CONTRACTOR. D. SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.
1011		2010-E	EXCAVATION (CLASS 10): A. THIS ITEM SHALL INCLUDE HAULING AND PLACEMENT OF THE MATERIAL WITHIN THE GRADING LIMITS, HAULING AND PLACEMENT OF EXCESS SOIL (WASTE), HAULING AND PLACEMENT OF BORROW MATERIAL, AND MATERIAL TESTING IN ACCORDANCE WITH THE SPECIFICATIONS AND THESE PLANS. B. ITEM SHALL NOT INCLUDE FURNISHING AND SPREADING OF TOPSOIL. C. THE CONTRACTOR SHALL DISPOSE OF EXCESS MATERIAL AND MATERIAL THAT IS NOT SUITABLE FOR EMBANKMENT CONSTRUCTION TO LOCATIONS AS SECURED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. D. THE FINISHED GRADE SHALL BE OF UNIFORM CROSS-SECTION AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF THE SUBBASE. F. CONTRACTOR SHALL NOTIFY CITY OF ANY DISPUTE WITH EXCAVATION PLAN QUANTITY PRIOR TO CONSTRUCTION, OTHERWISE PLAN QUANTITY WILL BE USED FOR PAYMENT. PAYMENT SHALL BE PLAN QUANTITY. G. DIRT QUANTITIES ASSUMED AN AVERAGE EXISTING PAVEMENT THICKNESS OF 6" AND SUBBASE THICKNESS OF 6" FOR THE PARKING LOT, AND AN AVERAGE PAVEMENT THICKNESS OF 8" AND SUBBASE THICKNESS OF 6" FOR THE ALLEY. EXCAVATION QUANTITIES WERE CALCULATED FROM BOTTOM OF EXISTING PAVEMENT TO BOTTOM OF PROPOSED SUBBASE. CUT = 173 CY, FILL + 30% = 86 CY, NET = 107 CY WASTE
1012	49	2010-D-4	SUBGRADE PREPARATION, 12 INCH: B. QUANTITY IS BASED ON THE AREA OF 12 INCH SUBGRADE PREPARATION, COMPLETED IN 2 - 6" LIFTS, EXTENDING 2 FOOT BEYOND THE PAVEMENT EDGE. C. IN INSTANCES OF CONFLICT WITH EXISTING UTILITIES, THE DEPTH MAY BE REDUCED AS DIRECTED BY THE ENGINEER. D. PREPARATION UNDER ENTRANCES, DRIVES, SIDEWALKS, AND PATHS IS INCIDENTAL TO THOSE ITEMS. E. THIS ITEMS INCLUDES ALL MOISTURE AND DENSITY TESTING TO BE PROVIDED BY THE CONTRACTOR. F. PRIOR TO COMPLETING SUBGRADE PREPARATION, THE CONTRACTOR SHALL PROOF ROLL THE AREA. IF THE PROOF ROLL PASSES, THE ENGINEER MAY ELECT TO NOT HAVE SUBGRADE PREPARATION PERFORMED IN THAT AREA. THE PROOF ROLL SHALL BE INCIDENTAL TO EXCAVATION
1013	52	2010-J	SUBBASE, MODIFIED, 4 INCHES: A. REFER TO SHEET C.500 FOR TYPICAL SECTIONS. BID ITEM SHALL BE USED UNDER ALL SIDEWALKS.
1014	53	2010-J	SUBBASE, MODIFIED, 6 INCHES: A. REFER TO SHEET C.500 FOR TYPICAL SECTIONS. BID ITEM SHALL BE USED UNDER ALL PARKING LOT, DRIVEWAY, AND ALLEY PAVEMENT SECTIONS.

ESTIMATE REFERENCE INFORMATION			
ITEM NO.	RELATED MAIN ST. RECONSTRUCTION BID ITEM NO. (FOR INFORMATION ONLY)	ITEM CODE	DESCRIPTION
1015		4020-A-1	STORM SEWER, TRENCHED, RCP, 12 INCH: A. REFER TO SHEET C.210 FOR STORM LOCATIONS. B. BEDDING CLASS SHALL BE R-2 FOR ALL RCP PIPES. TYPE OF PIPE ALLOWED SHALL BE RCP, CLASS III. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING BEDDING MATERIAL, PLACING BEDDING AND BACKFILL MATERIAL, JOINT WRAPPING AND OTHER FITTINGS, PIPE JOINTS, EXISTING PIPE CONNECTIONS, TESTING, AND INSPECTION. D. THE JOINTS WILL BE WRAPPED WITH ENGINEERING FABRIC AND IN ADDITION WHEN CROSSING WATER MAINS ONE FULL LENGTH OF RCP WITH FLEXIBLE O-RING GASKETED JOINTS WILL BE REQUIRED SO BOTH JOINTS ARE AS FAR AS POSSIBLE FROM THE WATER MAIN. G. POTHOLING FOR INSTALLATION OF THIS ITEM SHALL BE INCIDENTAL TO THIS BID ITEM UNLESS AUTHORIZED BY THE ENGINEER. H. ALL LOCATIONS THAT HAVE LESS THAN 18" VERTICAL SEPARATION OR 3' HORIZONTAL SEPARATION FROM WATERMAIN SHALL BE GASKETED FROM STRUCTURE TO STRUCTURE.
1016	124	6010-B	INTAKE, SINGLE GRATE (SW-501): A. REFER TO SHEET C.210 FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "NO DUMP, DRAINS TO WATERWAY". CASTING SHALL BE SW-603 TYPE R OR Q DEPENDING ON LOCATION. C. INTAKE SHALL BE EITHER CAST-IN-PLACE OR PRECAST. IF THE STRUCTURE IS NOT ABLE TO BE PRECAST THEN IT SHALL BE CAST-IN-PLACE WITH NO ADDITIONAL PAYMENT.
1017		7010-A	PAVEMENT, PCC 6 INCH: A. REFER TO SHEET C.500 FOR TYPICAL SECTIONS AND SHEET C.200 FOR LOCATIONS. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT WILL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED FOR ANY WORK ON THE PROJECT. B. ALL JOINTS SHALL BE SAW CUT TO A DEPTH OF T/3 AND SEALED. CONTRACTOR SHALL MEET SMOOTHNESS REQUIREMENTS FOR LOCAL STREETS AND COLLECTORS. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. C. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. THICKENED EDGES SHALL BE INCIDENTAL TO THIS BID ITEM, NO ADDITIONAL PAYMENT SHALL BE MADE. D. CONCRETE TESTING WILL BE PROVIDED BY THE CONTRACTOR. F. ADJUSTMENT OF CURB BOXES TO FG THAT FALL WITHIN THE PAVEMENT AREA SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.
1018		7010-A	PAVEMENT, PCC, 8 INCH: A. REFER TO SHEET C.500 FOR TYPICAL SECTIONS AND SHEET C.200. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT WILL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED FOR ANY WORK ON THE PROJECT. B. ALL JOINTS SHALL BE SAW CUT TO A DEPTH OF T/3 AND SEALED. CONTRACTOR SHALL MEET SMOOTHNESS REQUIREMENTS FOR LOCAL STREETS AND COLLECTORS. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. C. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. THICKENED EDGES SHALL BE INCIDENTAL TO THIS BID ITEM, NO ADDITIONAL PAYMENT SHALL BE MADE. D. CONCRETE TESTING WILL BE PROVIDED BY THE CONTRACTOR. F. ADJUSTMENT OF CURB BOXES TO FG THAT FALL WITHIN THE PAVEMENT AREA SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.
1019	135	7010-F	PLANTER CURB: A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL PCC PLANTER CURBS. SEE SHEET C.200 FOR LOCATIONS AND SHEET C.500 FOR DETAILS. B. ITEM SHALL INCLUDE ALL REINFORCING, COMPACTED AGGREGATE BASE AND SAW-CUT RELIEF JOINTS AS INCIDENTAL TO THE BID ITEM. C. ITEM IS TO BE PAID ON A LINEAR FOOT BASIS FOR ALL PLANTER CURB INSTALLED. D. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT WILL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED FOR ANY WORK ON THE PROJECT. E. CONCRETE TESTING WILL BE PROVIDED BY THE CONTRACTOR.

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE



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MCS D WELCOME CENTER
MARSHALLTOWN, IOWA

REFERENCE INFORMATION

PROJECT NO. 23-DS-0454
SHEET NO. C.103

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ESTIMATE REFERENCE INFORMATION			
ITEM NO.	RELATED MAIN ST. RECONSTRUCTION BID ITEM NO. (FOR INFORMATION ONLY)	ITEM CODE	DESCRIPTION
1020		7010-E	CURB AND GUTTER, 30"x6": A. ITEM INCLUDES FINAL SUBGRADE/SUBBASE PREPARATION, BARS AND REINFORCEMENT, JOINTS AND SEALING, SURFACE CURING AND PAVEMENT PROTECTION, AND BOXOUTS FOR FIXTURES.
1021	137	7030-A-1	REMOVAL OF SIDEWALK: A. THE THICKNESS OF THE EXISTING PAVEMENT IS VARIABLE. FULL DEPTH SAW CUTS SHALL BE INCIDENTAL TO THIS ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL REMOVAL, EARTHWORK, SUBGRADE PREPARATION, MODIFIED SUBBASE AND PAVING EXPENSES DUE TO DAMAGED EDGES. ADDITIONAL REMOVAL TO BE DETERMINED BY ENGINEER. PAYMENT SHALL BE MADE FOR THE AREA OF SIDEWALK REMOVED, REGARDLESS OF THICKNESS. B. THIS ITEM SHALL INCLUDE ALL LABOR AND EQUIPMENT NECESSARY TO REMOVE ALL SIDEWALK PAVING AND EARTHWORK NEEDED TO MAKE THE PROPOSED IMPROVEMENTS. REFER TO SHEET C.110 FOR REMOVAL LIMITS. C. CONTRACTOR SHALL SUBMIT PROPOSED REMOVAL EQUIPMENT TO ENGINEER FOR APPROVAL PRIOR TO ANY REMOVALS. EQUIPMENT SHALL NOT CAUSE ANY DAMAGE TO EXISTING BUILDINGS INCLUDING FOOTING, FOUNDATION WALLS, WALLS, WINDOWS, GLASS OR OTHER DECORATIONS.
1022	138	7030-A-3	REMOVAL OF DRIVEWAY: A. THE THICKNESS OF THE EXISTING PAVEMENT IS VARIABLE. FULL DEPTH SAW CUTS SHALL BE INCIDENTAL TO THIS ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL REMOVAL, EARTHWORK, SUBGRADE PREPARATION, MODIFIED SUBBASE AND PAVING EXPENSES DUE TO DAMAGED EDGES. ADDITIONAL REMOVAL TO BE DETERMINED BY ENGINEER. PAYMENT SHALL BE MADE FOR THE AREA OF DRIVEWAY REMOVED, REGARDLESS OF THICKNESS. B. THIS ITEM SHALL INCLUDE ALL LABOR AND EQUIPMENT NECESSARY TO REMOVE ALL DRIVEWAY PAVING AND EARTHWORK NEEDED TO MAKE THE PROPOSED IMPROVEMENTS. REFER TO C.110 FOR REMOVAL LIMITS. C. CONTRACTOR SHALL SUBMIT PROPOSED REMOVAL EQUIPMENT TO ENGINEER FOR APPROVAL PRIOR TO ANY REMOVALS. EQUIPMENT SHALL NOT CAUSE ANY DAMAGE TO EXISTING BUILDINGS INCLUDING FOOTING, FOUNDATION WALLS, WALLS, WINDOWS, GLASS OR OTHER DECORATIONS.
1023		7030-E	SIDEWALK, PCC, 4": A. CONCRETE SHALL BE A C-4 MIX WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI. M MIX CAN BE UTILIZED WHERE NEEDED TO REDUCE BUISNESS DOWNTIME. NO ADDITINAL PAYMENT WILL BE PROVIDED WHEN M MIX IS USED. B. AREAS NOT MEETING THIS REQUIREMENT SHALL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. C. COLD WEATHER CONCRETE WILL BE CONSIDERED INCIDENTAL IF REQUIRED. D. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. E. VARIATIONS IN THICKNESS AND WIDTH AND NECESSARY REBAR SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. REFER TO SHEET C.200 FOR LOCATIONS AND SHEET C.500 TYPICAL SECTION. F. CONCRETE TESTING SHALL BE PROVIDED BY THE CONTRACTOR
1024	143	7030-F	SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE: A. THIS ITEM INCLUDES SIDEWALK UNIT PAVERS PATTERN 'A' AND PATTERN 'B' WITH PCC BASE, POLYMERIC SAND FOR JOINTS, SAND SETTING BED, GEOTEXTILE FABRIC, 4 INCH THICK CONCRETE BASE, REBAR, AGGREGATE SUBBASE, WEEP HOLES AND SUBGRADE PREP. B. REFER TO SHEET C.200 FOR TYPE, LOCATION, FINISH, AND COLOR. REFER TO SHEET C.501 FOR INSTALLATION DETAILS AND PATTERNS. C. SEE SPECIFICATION SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
1025	144	7030-G	DETECTABLE WARNING: A. REFER TO SHEET C.200 FOR LOCATIONS. DETECTABLE WARNINGS SHALL BE CAST IRON. REFER TO MARSHALLTOWN SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL DETAILS.
1026	146	7030-I	DRIVEWAY, PAVED, PCC, 8 INCH: A. REFER TO SHEET C.200 FOR LAYOUT. ALL JOINTS SHALL BE CUT TO A DEPTH OF T/3 AND SEALED. B. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT SHALL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. CERTIFIED PLANT INSPECTION SHALL BE REQUIRED BY CONTRACTOR. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. C. QUANTITY FOR DRIVEWAY INCLUDES AN ADDITIONAL 10% OVER TABULATION TO ALLOW FOR UP TO 2 FEET OF DRIVEWAY REPLACEMENT BEYOND LIMITS SHOWN IN THE PLANS. THE ADDITIONAL 2 FEET SHALL ONLY BE UTILIZED BASED ON EXISTING DRIVEWAY CONDITION AND UPON APPROVAL OF THE ENGINEER
1027		7040-H	PAVEMENT REMOVAL: A. ALL REMOVALS TO BE MARKED AND MEASURED BY THE ENGINEER. FULL DEPTH SAW CUTS ALONG THE REMOVAL LIMITS ARE INCIDENTAL TO THIS ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL REMOVAL, EARTHWORK, SUBGRADE PREPARATION, MODIFIED SUBBASE AND PAVING EXPENSES DUE TO DAMAGED EDGES. ADDITIONAL REMOVAL TO BE DETERMINED BY ENGINEER. PAYMENT SHALL BE MADE FOR THE AREA OF PAVEMENT REMOVED, REGARDLESS OF THICKNESS. CONTRACTOR SHALL LEGALLY DISPOSE OF ALL MATERIALS AT AN OFF-SITE WASTE AREA.
1028		7040-I	CURB AND GUTTER REMOVAL: A. ALL REMOVALS TO BE MARKED AND MEASURED BY THE ENGINEER. FULL DEPTH SAW CUTS ALONG THE REMOVAL LIMITS ARE INCIDENTAL TO THIS ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL REMOVAL, EARTHWORK, SUBGRADE PREPARATION, MODIFIED SUBBASE AND PAVING EXPENSES DUE TO DAMAGED EDGES. ADDITIONAL REMOVAL TO BE DETERMINED BY ENGINEER. PAYMENT SHALL BE MADE FOR THE AREA OF PAVEMENT REMOVED, REGARDLESS OF THICKNESS. CONTRACTOR SHALL LEGALLY DISPOSE OF ALL MATERIALS AT AN OFF-SITE WASTE AREA.

ESTIMATE REFERENCE INFORMATION			
ITEM NO.	RELATED MAIN ST. RECONSTRUCTIO N BID ITEM NO. (FOR INFORMATION ONLY)	ITEM CODE	DESCRIPTION
1029	150	8020-B	PAINTED PAVEMENT MARKINGS, SOLVENT/WATERBORNE: A. REFER TO SHEET C.200 FOR LOCATIONS AND SHEET C.500 FOR DETAILS. B. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC), CHAPTER 130.
1030	151	8020-G	PAINTED SYMBOLS AND LEGEND: A. REFER TO SHEET C.200 FOR LOCATION AND SHEET C.500 FOR DETAILS. B. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC), CHAPTER 130.
1031	156	9030-B	PLANTS WITH WARRANTY, DECIDUOUS SHRUB (#5 CONT): A. THIS ITEM INCLUDES LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL DECIDUOUS SHRUB (#5 CONT) IN ACCORDANCE WITH SUDAS SECTION 9030 AND AMENDED AS FOLLOWS: PLANTINGS SHALL HAVE ONE YEAR WARRANTY FROM DATE OF FINAL ACCEPTANCE FOR ALL PLANTINGS IN THE PROJECT. B. ACCEPTANCE OF PLANT MATERIALS CONSTRUES FULL PAYMENT (MINUS ANY PROJECT RETAINAGE). C. INCLUDES ALL, BUT NOT LIMITED TO, EXCAVATION, INSTALLATION, HERBICIDE, MAINTENANCE AND WATERING DURING WARRANTY; AND REPLACEMENTS AS REQUIRED. D. SEE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION.
1032	158	9030-B	PLANTS WITH WARRANTY, DECIDUOUS TREE: A. THIS ITEM INCLUDES LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL DECIDUOUS TREE IN ACCORDANCE WITH SUDAS SECTION 9030 AND AMENDED AS FOLLOWS: PLANTINGS SHALL HAVE ONE YEAR WARRANTY FROM DATE OF FINAL ACCEPTANCE FOR ALL PLANTINGS IN THE PROJECT. B. ACCEPTANCE OF PLANT MATERIALS CONSTRUES FULL PAYMENT (MINUS ANY PROJECT RETAINAGE). C. INCLUDES ALL, BUT NOT LIMITED TO, EXCAVATION, INSTALLATION, STAKING, HERBICIDE, MAINTENANCE AND WATERING DURING WARRANTY; AND REPLACEMENTS AS REQUIRED. SEE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION.
1033	159	9033-999-A	RUBBER MULCH: A. INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL RUBBER MULCH IN LANDSCAPE BEDS WHERE INDICATED ON C.400. REFER TO C.501 FOR DETAIL. C. EXCAVATION AND DISPOSAL OF EXCAVATED MATERIAL, FURNISH AND PLACEMENT OF 5 OZ., WOVEN, COMMERCIAL GRADE LANDSCAPE FABRIC IS CONSIDERED INCIDENTAL. D. ITEM SHALL BE MEASURED AND PAID BY THE CY OF INSTALLED RUBBER MULCH.
1034	163	9040-F-1	WATTLE, STRAW, 9 INCH: A. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, ANCHORING STAKES, MAINTENANCE, REPLACEMENT OF DEFICIENT WATTLE, RESTORATION OF THE AREA TO FINISHED GRADE, AND OFF-SITE DISPOSAL OF THE WATTLE AND ACCUMULATED SEDIMENT.
1035	164	9040-O-1	STABILIZED CONSTRUCTION ENTRANCE: A. ITEM INCLUDES THE INSTALLATION AND REMOVAL OF THE ROCK AND SUBGRADE STABILIZATION FABRIC FOR STABILIZED CONSTRUCTION ENTRANCES.
1036	165	9040-T-1	INLET PROTECTION: A. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, ALL LABOR AND MATERIALS NECESSARY FOR INSTALLATION, REMOVAL AND OFF-SITE DISPOSAL OF ACCUMULATED SEDIMENT, AND REMOVAL OF DEVICE UPON COMPLETION OF THE PROJECT. B. PROTECTION DEVICES SHALL BE UTILIZED ON ALL INTAKES REGARDLESS OF TYPE OF INTAKE
1037	168	11020-A	MOBILIZATION A. THIS ITEM IS FOR ALL PREPARATORY WORK AND COSTS INCURRED BEFORE BEGINNING THE WORK ON THE PROJECT AND DURING THE PROJECT. THIS ITEM SHALL ALSO INCLUDE THE COSTS FOR ANY STAGED CONSTRUCTION AND EQUIPMENT SET UP TO COMPLETE THE WORK. NO CHANGE IN CONTRACT PRICE WILL BE MADE FOR ANY ADDITIONAL WORK ADDED TO THE CONTRACT. PROJECT CONSTRUCTION IS ANTICIPATED TO BE MULTIPLE CONSTRUCTION SEASONS AND NO ADDITIONAL PAYMENT WILL BE MADE FOR MOBILIZATION BEYOND THE CONTRACT UNIT PRICE.

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE



Clapsaddle-Garber Associates, Inc.
16 East Main Street
Marshalltown, Iowa 50158
Ph 641-752-4701
www.cgaconsultants.com

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MCS D WELC OME C E N T E R
MARSHALLTOWN, IOWA

REFERENCE INFORMATION

PROJECT NO. 23-DS-0454
SHEET NO. C.104

1. ADJOINING PROPERTIES SHALL BE PROTECTED DURING DEMOLITION OPERATIONS. DEBRIS ON ADJOINING PROPERTIES SHALL BE CAREFULLY REMOVED BY CONTRACTOR.
2. ANY DAMAGE TO EXISTING PAVEMENT TO REMAIN DUE TO CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. ALL EFFORTS SHALL BE MADE TO NOT DISTURB EXISTING PAVEMENT TO REMAIN.
3. REMOVE ALL SIGNS, LIGHTS, POSTS, POLES, WALLS, AND ASSOCIATED FOUNDATIONS AS INDICATED. BACKFILL ALL HOLES AND DEPRESSIONS WITH SUITABLE SOIL.
4. CONTRACTOR SHALL SUPPLY DETAILED CONSTRUCTION SCHEDULE TO THE CITY.
5. ONE WEEK PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY:
A. CITY OF MARSHALLTOWN
B. OWNER
C. CLAPSADDLE-GARBER ASSOCIATES, INC.
6. CONTRACTOR SHALL DISPOSE OF PAVEMENT & FENCING OFF-SITE
7. ALL CONSTRUCTION MATERIALS, DUMPSTERS, DETACHED TRAILERS, OR SIMILAR ITEMS ARE PROHIBITED ON PUBLIC STREETS OR WITHIN THE PUBLIC RIGHT-OF-WAY.

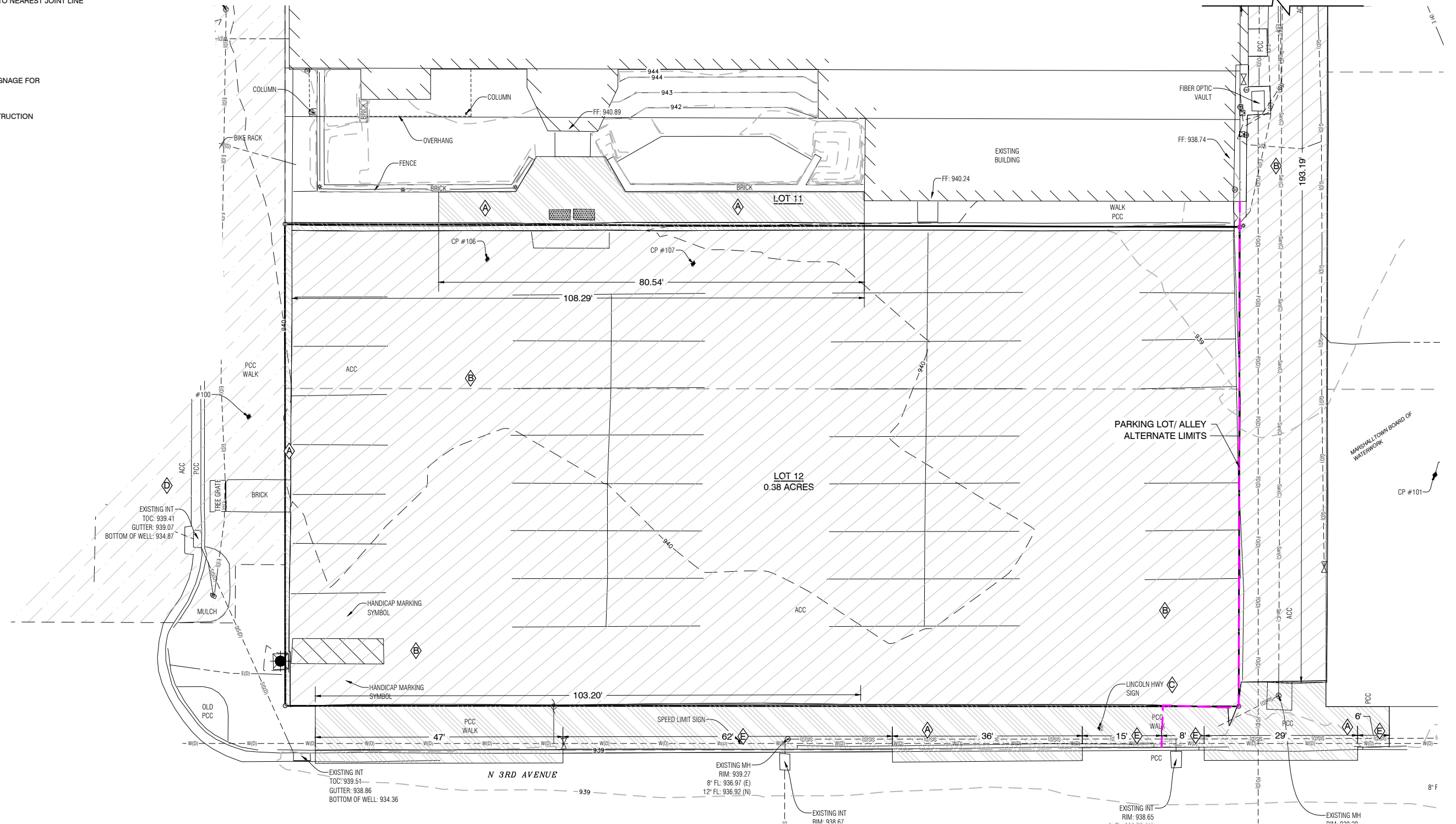
A REMOVE CONCRETE & ALL ASSOCIATED CURBS TO NEAREST JOINT LINE OR AS INDICATED.

B REMOVE ASPHALT & ALL ASSOCIATED CURBS.

C REMOVE EXISTING SIGN. PRESERVE EXISTING SIGNAGE FOR RE-INSTALLATION

D APPROXIMATE LIMITS OF MAIN STREET RECONSTRUCTION

E PROTECT EXISTING CURB AND GUTTER



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MCS D WELCOME CENTER

EXISTING CONDITIONS & DEMOLITION PLAN

PROJECT NO.	23-DS-0454
SHEET NO.	C.110

GENERAL LAYOUT NOTES:

- 1. ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.
- 2. ALL WORK SHALL BE IN ACCORDANCE WITH OSHA CODES & STANDARDS. NOTHING INDICATED ON THESE DRAWINGS SHALL RELIEVE THE CONTRACTOR FROM COMPLYING WITH APPROPRIATE SAFETY REGULATIONS.
- 3. SIGHT LIGHTING SHALL BE DETERMINED BY THE OWNER.
- 4. ALL DISTURBED AREAS SHALL BE SEEDED, FERTILIZED & MULCHED UNLESS OTHERWISE NOTED IN PLANS. REFER TO LANDSCAPING PLAN.
- 5. ANY DAMAGE TO THE PAVEMENT NOT SHOWN FOR REMOVAL ON THE PLANS DUE TO CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE. ALL EFFORTS SHALL BE MADE TO NOT DISTURB EXISTING PAVEMENT.
- 6. COORDINATE GAS, ELECTRIC, TELEPHONE, & FIBER OPTIC WITH RESPECTIVE UTILITY COMPANIES.
- 7. ALL CONSTRUCTION MATERIALS, DUMPSTERS, DETACHED TRAILERS, OR SIMILAR ITEMS ARE PROHIBITED ON PUBLIC STREETS OR WITHIN PUBLIC RIGHT-OF-WAY.

TRAFFIC CONTROL NOTES:

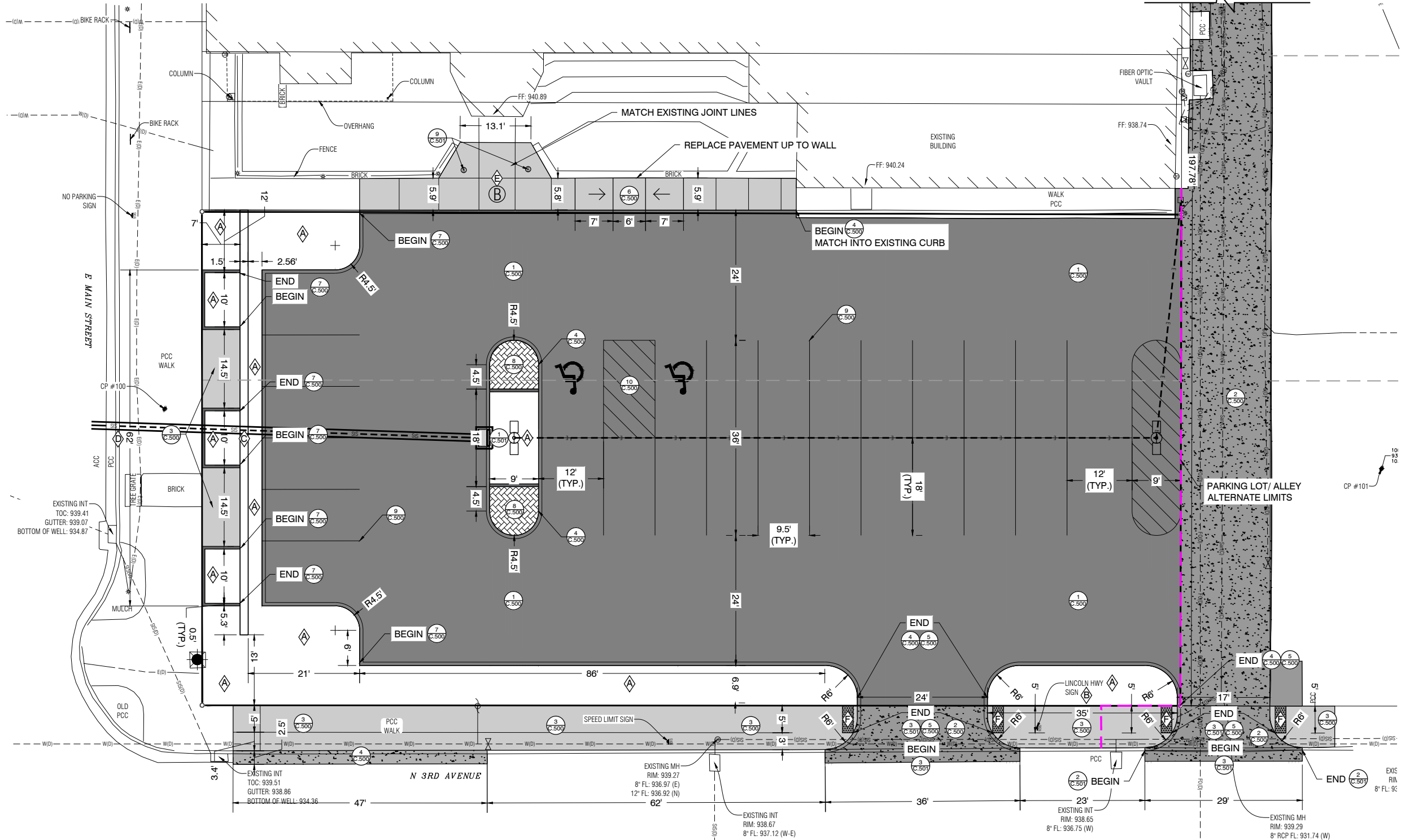
- 1. ALL TRAFFIC CONTROL DEVICES & BARRIERS SHALL BE FURNISHED, ERECTED, MAINTAINED, & REMOVED BY THE CONTRACTOR.
- 2. PROPOSED CHANGES TO THE TRAFFIC CONTROL PLAN SHALL BE REVIEWED WITH THE ENGINEER BEFORE CHANGES ARE MADE.
- 3. ACCESS TO NEIGHBORING BUILDINGS SHALL BE MAINTAINED AT ALL TIMES.
- 4. ALL UTILITY WORK WITHIN THE PUBLIC R.O.W. SHALL CONFORM TO THE CITY OF MARSHALLTOWN STANDARDS & THE CURRENT ADDITION OF THE MUTCD.
- 5. TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES ALONG E MAIN ST. & S 3RD AVE.
- 6. THE CONTRACTOR SHALL USE CARE WHEN WORKING UNDER/OVER/AROUND ELECTRICAL LINES.
- 7. FLASHING OR STEADY BURN WARNING LIGHTS ARE REQUIRED ON TYPE II BARRICADES FOR OVERNIGHT CLOSURES.
- 8. WORK AREA MUST BE ENCLOSED WITH BARRICADES, FENCING, OR A COMBINATION OF THE TWO.

CONSTRUCTION DETAILS

- 1. INSTALL 6" PCC PAVEMENT
- 2. INSTALL 8" PCC PAVEMENT SECTION
- 3. INSTALL 4" PCC SIDEWALK PAVEMENT
- 4. INSTALL 6" STANDARD CURB & GUTTER
- 5. INSTALL CURB RUNOUT
- 6. INSTALL PARALLEL CURB RAMP
- 7. INSTALL MONOLITHIC PCC CURB
- 8. INSTALL PAVERS
- 9. INSTALL MARKINGS
- 10. INSTALL ACCESSIBLE PARKING STALLS
- 1. INSTALL SINGLE GRATE INTAKE SW-501
- 2. INSTALL DRIVEWAY DROP-CURB
- 3. INSTALL SIDEWALK DROP CURB
- 9. INSTALL STEEL BOLLARD

CONSTRUCTION NOTES:

- A LANDSCAPE BED SEE SHEET C.400 (LANDSCAPE)
- B RE-INSTALL EXISTING SIGN WITH NEW POLE & FOUNDATION
- C INSTALL SEATING WALL
- D COORDINATE TO MATCH MAIN STREET RECONSTRUCTION PLAN
- E INSTALL DECORATIVE CONCRETE BOLLARD TO MATCH MCSD HIGH SCHOOL(CONFIRM WITH OWNER ON DETAILS)
- F INSTALL DETECTABLE WARNING



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MCSD WELCOME CENTER
MARSHALLTOWN, IOWA

LAYOUT PLAN

PROJECT NO. 23-DS-0454
SHEET NO. C.200

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GENERAL UTILITY NOTES:

- 1. ONE WEEK PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE CITY OF MARSHALLTOWN.
- 2. ALL SITE UTILITIES SHALL BE BROUGHT WITHIN 5' OF THE BUILDING TO CONNECT TO PLUMBING CONTRACTORS WORK
- 3. COORDINATE GAS, ELECTRIC, TELEPHONE AND FIBER OPTIC SERVICE WITH RESPECTIVE UTILITY COMPANIES. COSTS ASSOCIATED WITH RELOCATING THESE UTILITIES ON THE PUBLIC SIDE OF THE METER/BUILDING DEMARCATION POINT FOR THE PURPOSES OF CONSTRUCTION SHALL BE BY THE OWNER. COSTS FOR RELOCATING THESE UTILITIES ON THE PRIVATE SIDE OF THE METER/BUILDING DEMARCATION POINT SHALL BE PART OF THE CONTRACTOR'S BASE BID.
- 4. SEWER FLOW LINES, PIPE MATERIAL, & PIPE SIZES SHALL BE FIELD VERIFIED PRIOR TO INSTALLING PIPE OR ORDERING STRUCTURES.
- 5. FINAL LOCATION AND SIZE OF UTILITIES SERVICE LINES TO BE DETERMINED BY OWNER.
- 6. ALL WORK SHALL BE IN ACCORDANCE WITH OSHA CODES & STANDARDS. NOTHING INDICATED ON THESE DRAWINGS SHALL RELIEVE THE CONTRACTOR FROM COMPLYING WITH APPROPRIATE SAFETY REGULATIONS.
- 7. REFER TO 500 SHEETS FOR UTILITY DETAILS.
- 8. ALL ROOF DRAINS SHALL BE TIED INTO STORM SEWER LINES
- 9. ALL UNDERGROUND UTILITIES SHALL HAVE TRACER WIRE INSTALLED.

CONSTRUCTION DETAILS

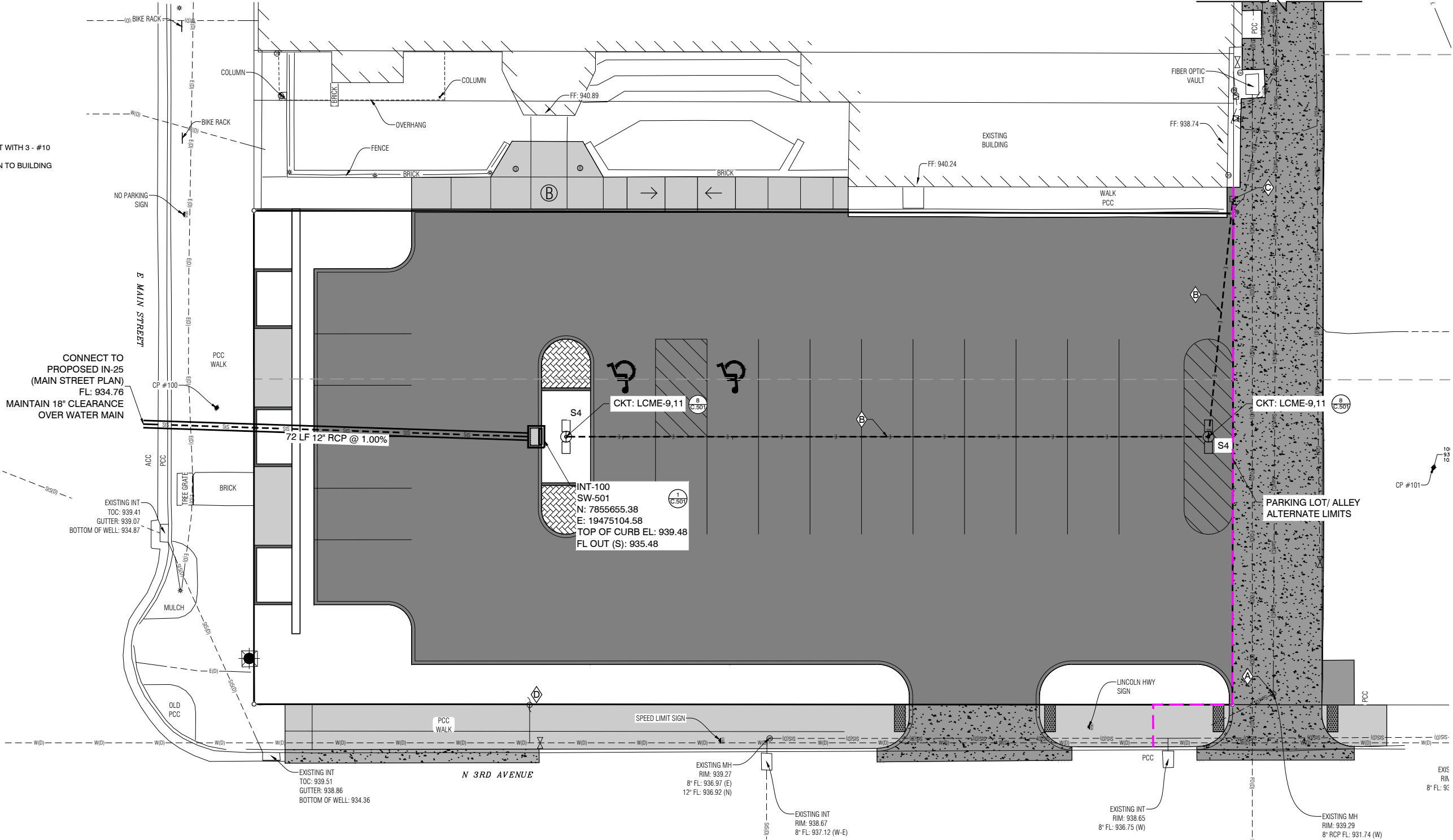
- 1. INSTALL SINGLE GRATE INTAKE SW-501
- 8. INSTALL EXTENDED POLE BASE

CONSTRUCTION NOTES:

- A. ADJUST MANHOLE TO BE FLUSH WITH PAVING
- B. INSTALL APPROXIMATELY 170 LF OF ELECTRICAL CONDUIT WITH 3 - #10
- C. INSTALL HANDHOLE HH-2 (OWNER TO MAKE CONNECTION TO BUILDING ELECTRIC)
- D. ADJUST CURB STOP TO BE FLUSH WITH PAVING

LUMINAIRE SCHEDULE												
TYPE	DESCRIPTION	MANUFACTURER/MODEL	FINISHES	LIGHT SOURCE	MOUNTING	DELIVERED LUMENS	CRI	CCT	DIMMING	DISTRIBUTION	WATTS	VOLTAGE
S4	TWO-HEADED AREA LIGHT, FLAT LENS, ACA ARM AT 18° 30 DEGREES	LUMEC DMS50RS80SJ	BLACK	LED	22' POLE	7400/HEAD	70	4000K	-	TYPE III	108 VA	240

GENERAL ELECTRICAL SCHEDULE		
SYMBOL	DESCRIPTION	MANUFACTURER
PANEL, LCME	WALL MOUNTED CONTROL CABINET, 208/120V, 3-PHASE, 4-WIRE, NEMA 3R HOUSING, REFER TO PANEL SCHEDULES FOR DETAILS	MILLBANK CT38



GENERAL GRADING NOTES

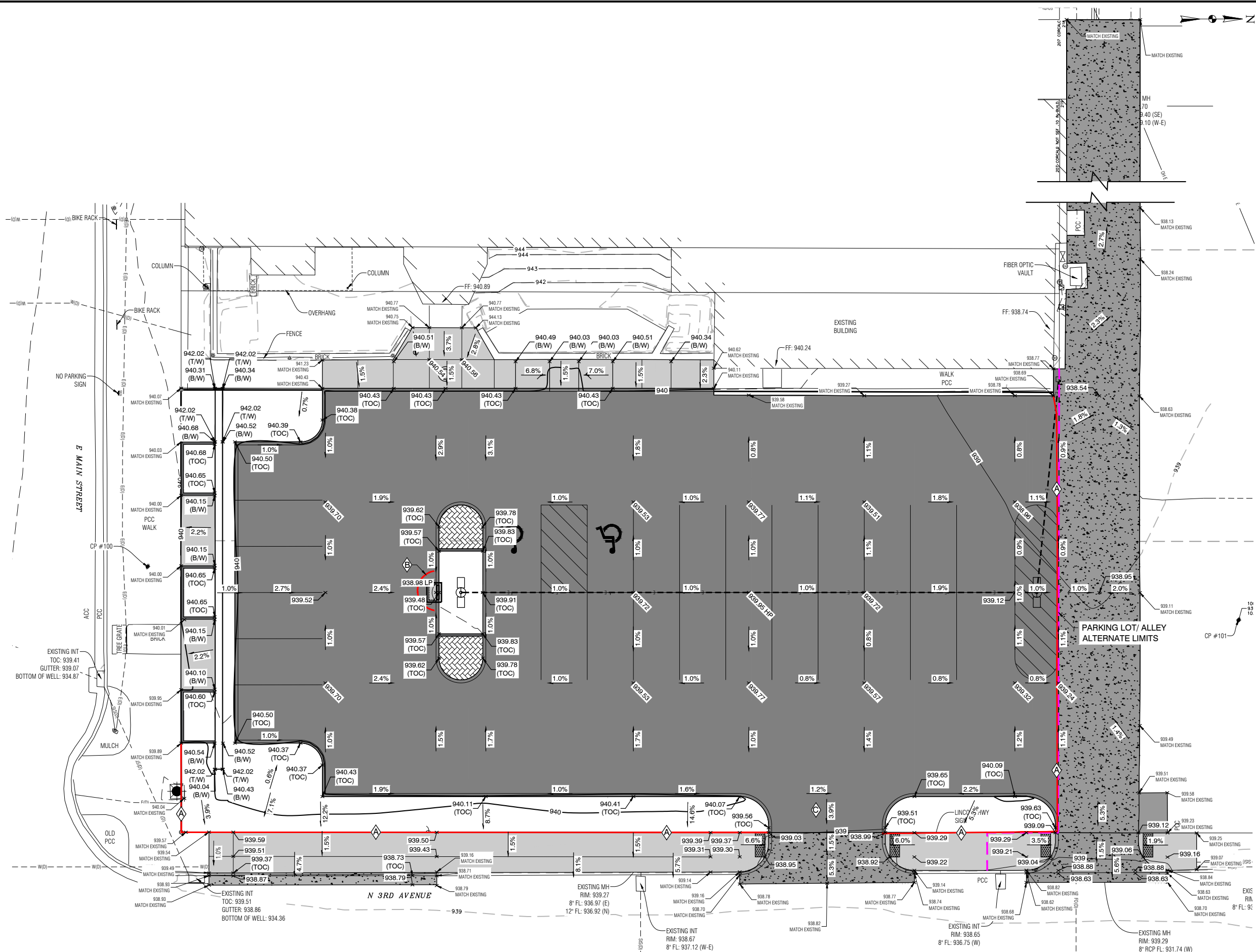
- 1. SLOPES SHALL NOT BE GREATER THAN 3:1
- 2. GRADE TO DRAIN AWAY FROM ALL BUILDINGS.
- 3. SIDEWALK CROSS SLOPES SHALL NOT EXCEED 2%. CONTRACTOR SHALL TARGET 1.5% CROSS SLOPE.
- 4. STRIP TOPSOIL TO WHATEVER DEPTHS ARE ENCOUNTERED (A MINIMUM OF 6") & STOCKPILE AS PER PLAN. RESPREAD TOPSOIL AT LEAST 8" DEEP AS PER SPECIFICATIONS.
- 5. GEOTECHNICAL REPORT IS AVAILABLE UPON REQUEST.

LEGEND

- TOC TOP OF CURB
- HP HIGH POINT
- LP LOW POINT
- T/W TOP OF WALL
- B/W BOTTOM OF WALL
- 2.0% PROPOSED SLOPE
- PROPOSED DRAINAGE PATTERN

CONSTRUCTION NOTES:

- A INSTALL STRAW WATTLE (9 IN)
- B INSTALL INLET PROTECTION
- C INSTALL CONSTRUCTION ENTRANCE IF ACCESS TO SITE IS NOT FROM MAIN STREET RECONSTRUCTION PROJECT



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MCSD WELCOME CENTER
MARSHALLTOWN, IOWA

GRADING PLAN & SWPPP

PROJECT NO.
23-DS-0454
SHEET NO.
C.300

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LANDSCAPE NOTES:

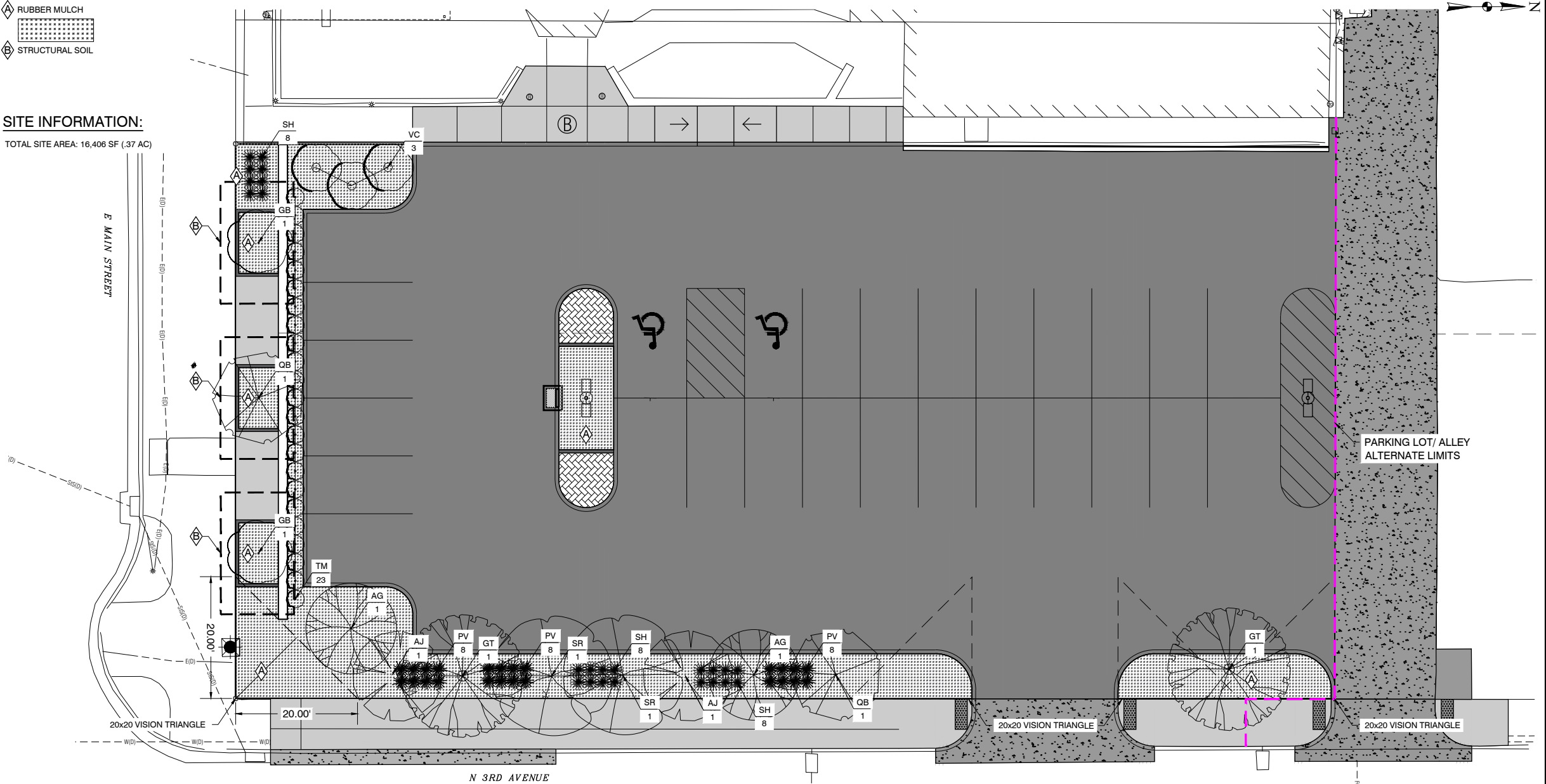
1. PLANT QUANTITIES ARE FOR INFORMATION ONLY; DRAWING SHALL PREVAIL IF CONFLICT OCCURS. CONTRACTOR IS RESPONSIBLE FOR CALCULATING OWN QUANTITIES AND BASING BID ACCORDINGLY.
2. CONTRACTOR SHALL PLACE RUBBER MULCH AROUND ALL TREES AND IN SPECIFIED PLANTING BEDS(SEE LANDSCAPE CONSTRUCTION NOTES) TO A DEPTH OF 3". WALNUT PRODUCTS ARE PROHIBITED.
3. KIND, SIZE AND QUALITY OF PLANT MATERIAL SHALL CONFORM TO AMERICAN STANDARD FOR NURSERY STOCK, ANSI 260-2004, OR MOST RECENT EDITION.
4. THE CONTRACTOR SHALL REPORT SUBSURFACE SOIL OR DRAINAGE PROBLEMS TO THE ENGINEER.
5. THE CONTRACTOR SHALL SHOW PROOF OF PROCUREMENT, SOURCES, QUANTITIES AND VARIETIES FOR ALL SHRUBS, PERENNIALS, ORNAMENTAL GRASSES WITHIN 21 DAYS FOLLOWING THE AWARD OF CONTRACT. TIMELY PROCUREMENT OF ALL PLANT MATERIAL IS ESSENTIAL TO THE SUCCESSFUL COMPLETION AND INITIAL ACCEPTANCE OF THE PROJECT.
6. SUBSTITUTIONS SHALL ONLY BE ALLOWED WHEN THE CONTRACTOR HAS EXHAUSTED ALL SOURCES FOR THE SPECIFIED MATERIAL, AND HAS PROVEN THAT THE SPECIFIED MATERIAL IS NOT AVAILABLE. THE CONTRACTOR MUST PROVIDE NAME AND VARIETY OF SUBSTITUTION TO THE ENGINEER FOR APPROVAL PRIOR TO TAGGING OR PLANTING. SUBSTITUTIONS SHALL BE NEAREST EQUIVALENT SIZE OF VARIETY OF PLANT HAVING SAME ESSENTIAL CHARACTERISTICS.
7. ALL PLANT MATERIAL SHALL BE NURSERY GROWN, SOUND, HEALTHY, VIGOROUS AND FREE FROM INSECTS, DISEASE AND INJURIES, WITH HABIT OF GROWTH THAT IS NORMAL FOR THE SPECIES. SIZES SHALL BE EQUAL TO OR EXCEEDING SIZES INDICATED ON THE PLANT SCHEDULE. THE CONTRACTOR SHALL SUPPLY PLANTS IN QUANTITY AS SHOWN ON DRAWINGS.
8. STAKE OR PLACE ALL PLANTS IN FIELD AS INDICATED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER FOR APPROVAL BY THE OWNER PRIOR TO PLANTING. REMOVE STAKING AT END OF WARRANTY PERIOD.
9. ALL DISTURBED AREAS NOT OTHERWISE COVERED BY BUILDING, PAVEMENT, AND LANDSCAPE BEDS SHALL BE COVERED WITH SOD OR AS APPROVED BY THE OWNER.
10. CONTRACTOR SHALL PLACE TOPSOIL FROM THE SITE OR SOIL CONDITIONED OR TILLED INTO THE TOP 6 INCHES WITH AT LEAST A 5% ORGANIC CONTENT, INTO REQUIRED PLANTING AREAS(YARD AREAS, BUFFER YARDS, OR PLANTERS).
11. STOCKPILED TOPSOIL SHOULD BE PLIABLE LOAM, SECURE FROM NATURALLY WELL-DRAINED AREAS, FREE OF ADMIXTURE OF SUBSOIL, FREE FROM CLAY LUMPS + STONE AND OTHER DEBRIS OVER 1 INCH IN DIAMETER.(PER IOWA DOT SPEC. SP-155079)
12. TOPSOIL SHALL HAVE A PH VALUE OF MINIMUM 5.5 AND MAXIMUM OF 7.0.(PER IOWA DOT SPEC. SP-155079)
13. CONTRACTOR IS RESPONSIBLE FOR TESTING TOPSOIL AND SUBMITTING TEST RESULTS TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO USE AND PLACEMENT.(PER IOWA DOT SPEC. SP-155079)
14. THE REQUIRED LANDSCAPING, BOTH EXISTING AND PROPOSED, SHALL BE MAINTAINED FOR THE LIFE OF THE CERTIFICATE OF OCCUPANCY. EXISTING LANDSCAPING BUFFER IN THE NORTH WILL BE PRESERVED TO PROVIDE SCREENING FROM NEIGHBORING PROPERTY OWNERS IN THE NORTH & IN THE WEST.
15. ALL WIRE, TWINE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL OF TREES PRIOR TO PLANTING.
16. LANDSCAPE PLANTERS THAT INCLUDE OVERSTORY TREES SHALL INCLUDE A MINIMUM OF 750 CF OF UNCOMPACTED SOIL WITH A DEPTH OF 2-4 FEET FOR THE FIRST TREE + AN ADDITIONAL 375 CF OF UNCOMPACTED SOIL WITH A DEPTH OF 2-4 FEET FOR EACH ADDITIONAL OVERSTORY TREE WITHIN AN INTERCONNECTED PLANTER.
17. LANDSCAPE PLANTERS THAT INCLUDE UNDERSTORY TREES SHALL INCLUDE A MINIMUM OF 450 CF OF UNCOMPACTED SOIL WITH A DEPTH OF 2-4 FEET + AN ADDITIONAL 225 CF OF UNCOMPACTED SOIL WITH A DEPTH OF 2-4 FEET FOR THE EACH ADDITIONAL UNDERSTORY TREE WITHIN AN INTERCONNECTED PLANTER.
18. RUBBER MULCH PRODUCT TO BE XYLEM LTD, COLOR: REDWOOD, OR APPROVED EQUAL.

LANDSCAPE CONSTRUCTION NOTES:

- A RUBBER MULCH
- B STRUCTURAL SOIL

SITE INFORMATION:

TOTAL SITE AREA: 16,406 SF (.37 AC)



PLANT SCHEDULE

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE
Deciduous Overstory Trees				
GT	Gleditsia triacanthos inermis 'Draves'	Street Keeper Honey Locust	2	2" B&B
QB	Quercus x bimundorum 'JFS-KW1Qx'	Streetspire Oak	2	2" B&B
Ornamental Understory Trees				
AG	Amelanchier x grandiflora 'Autumn Brilliance'	Autumn Brilliance Serviceberry(Tree Form and Fruitless)	2	1.5" B&B
GB	Ginkgo biloba 'Sky Tower'	Ginkgo 'Sky Tower'(Fruitless)	2	1.5" B&B
SR	Syringa reticulata 'Ivory Silk'	Ivory Silk Japanese Lilac Tree	2	1.5" B&B
AJ	Acer x pseudosieboldianum 'IsIAJ'	Arctic Jade Maple	2	1.5" B&B
Grasses & Shrubs				
SH	Sporobolus heterolepis	Prairie Dropseed	24	#1 CNT
PV	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	24	#1 CNT
TM	Taxus x media	Stonehenge Dark Druid Yew	23	# 5 CNT
VC	Viburnum carlesii	Korean Spice Viburnum(Medium)	3	# 5 CNT

SITE TREE REQUIREMENTS

#	ZONING DESCRIPTION	REQUIRED	PROPOSED
1	156.F.003(3)(a) Development Landscaping A Minimum of Five Overstory Trees per Acre(.37)	2 Trees	4 Trees

PARKING LOT LANDSCAPING

#	ZONING DESCRIPTION	REQUIRED	PROPOSED
1	156.F.003(5) Development Landscaping Whenever an off-street parking area fronts along a public street, an average of one overstory and two understory trees shall be planted every 75 feet within the parking lot setback area.	4 Overstory and 8 Understory Trees	4 Overstory and 8 Understory Trees



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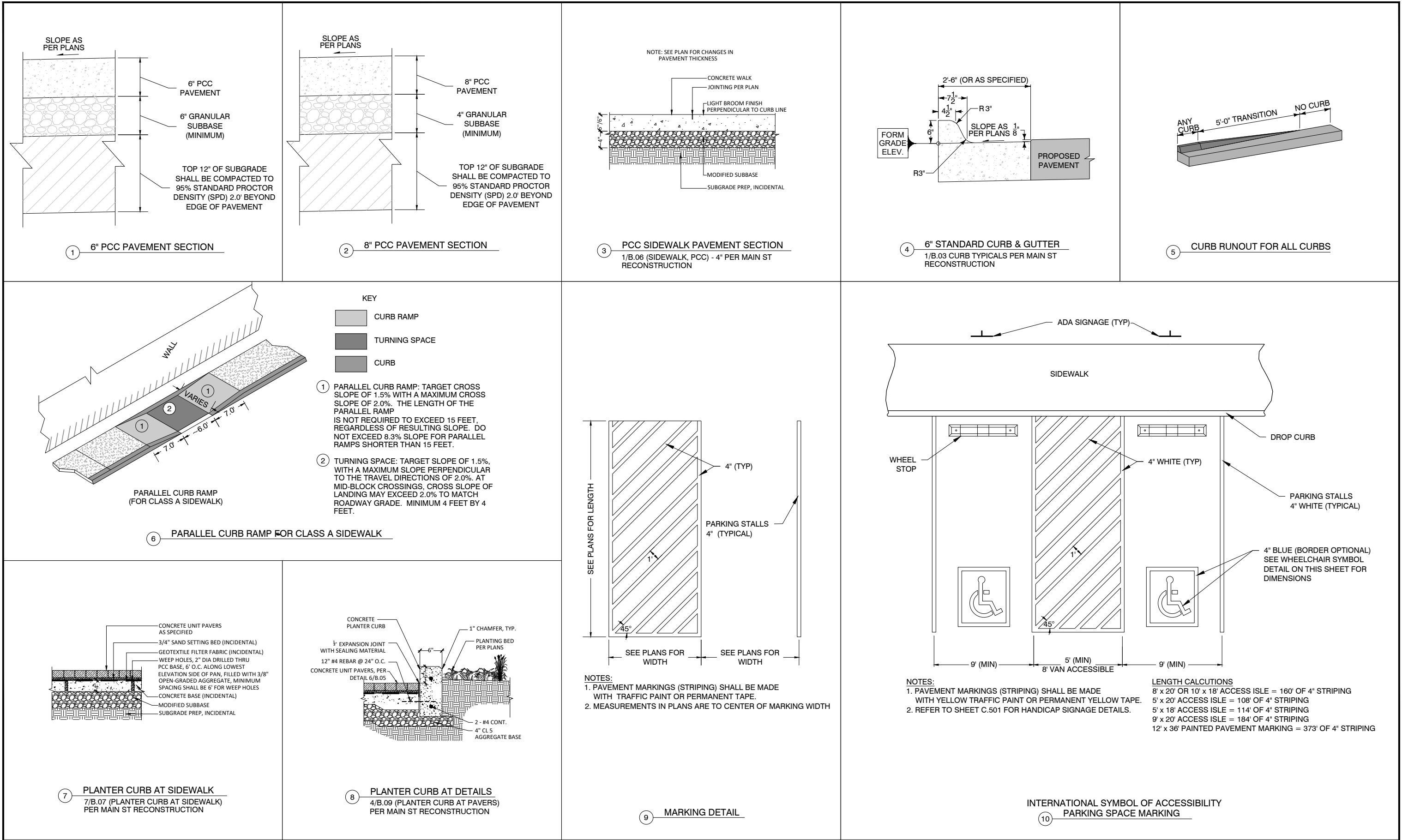
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Ph 641-752-4701
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MCSD WELCOME CENTER
MARSHALLTOWN, IOWA

LANDSCAPE PLAN

PROJECT NO.
23-DS-0454
SHEET NO.
C.400



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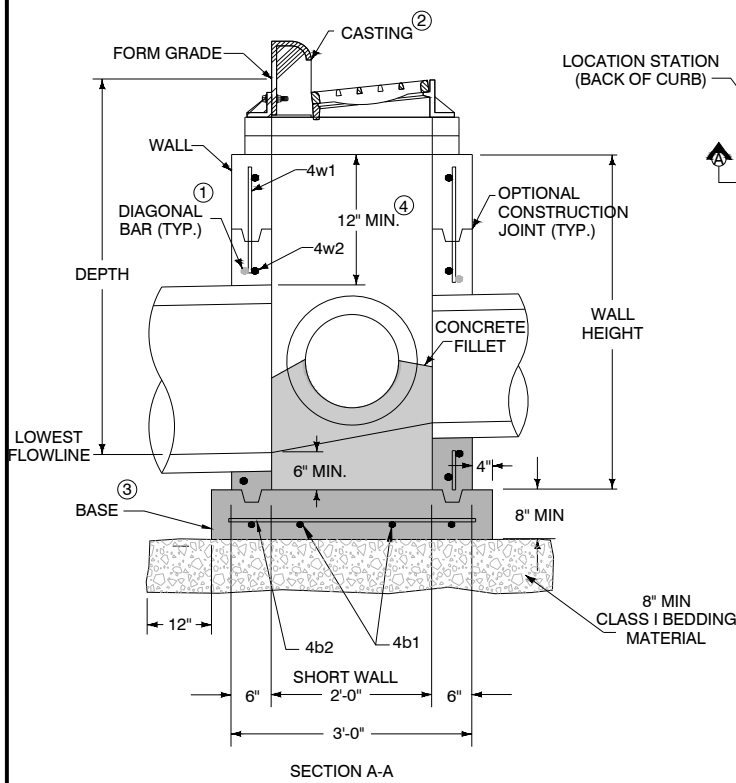
Clapsaddle-Garber Associates, Inc.
1523 S. Bell Ave. Suite 101
Ames, Iowa 50010
Ph 515-282-1794
www.cgaconsultants.com

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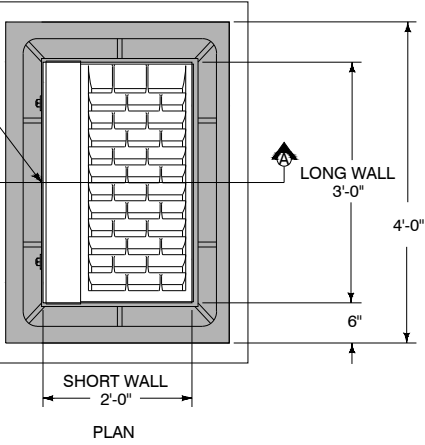
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DETAILS	PROJECT NO. 23-DS-0454
	SHEET NO. C.500

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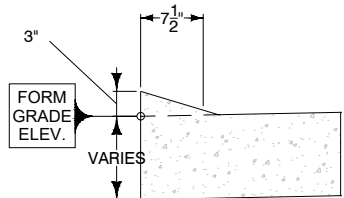
REINFORCING BAR LIST						
MARK	SIZE	LOCATION	SHAPE	LENGTH	COUNT	SPACING
4w1	4	Walls		Wall Height minus 4"	14	12"
4w2	4	Long Walls		3'-8"	Varies	12"
4w3	4	Short Walls		2'-8"	Varies	12"
4b1	4	Base		4'-2"	4	10"
4b2	4	Base		3'-2"	5	10"



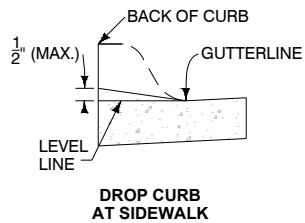
- REFER TO SW-514 FOR BOXOUT DETAILS.
- INSTALL FOUR #4 DIAGONAL BARS AT ALL PIPE OPENINGS.
 - SW-603 TYPE R UNLESS TYPE Q IS SPECIFIED IN THE CONTRACT DOCUMENTS.
 - CAST-IN-PLACE BASE SHOWN. IF BASE IS PRECAST INTEGRAL WITH WALLS, THE FOOTPRINT OF THE BASE IS NOT REQUIRED TO EXTEND BEYOND THE OUTER EDGE OF THE WALLS.
 - 12 INCH MINIMUM WALL HEIGHT ABOVE ALL PIPES.

MAXIMUM PIPE DIAMETERS		
PIPE LOCATION	Precast Structure	Cast-in-place Structure
Short Wall	15"	18"
Long Wall	24"	30"

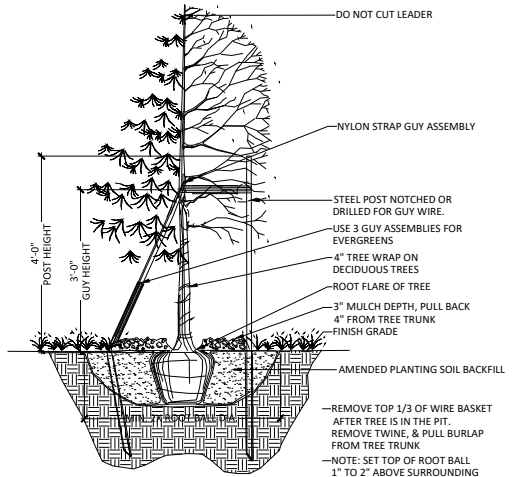
1 SINGLE GRATE INTAKE SW-501



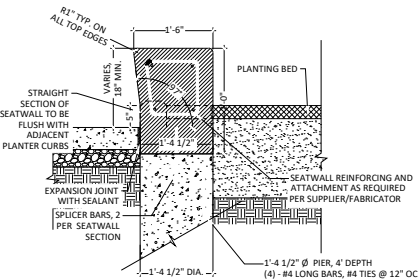
2 DRIVEWAY DROP CURB
1/B.03 CURB TYPICALS PER MAIN ST RECONSTRUCTION



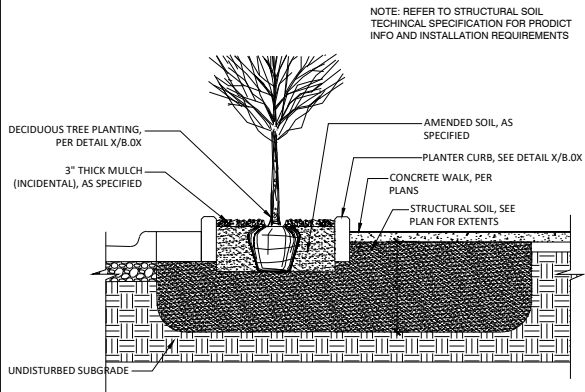
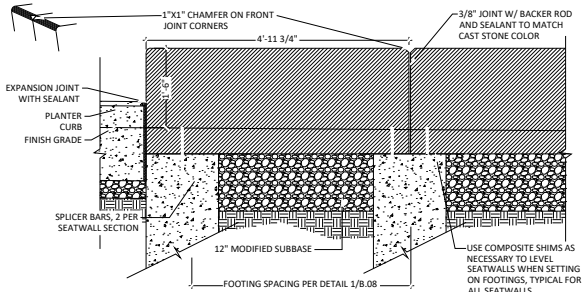
3 SIDEWALK DROP CURB
1/B.03 CURB TYPICALS PER MAIN ST RECONSTRUCTION



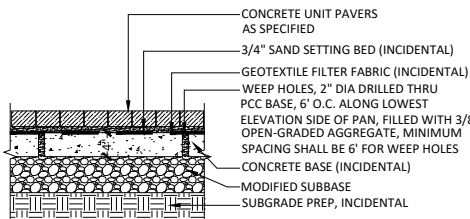
4 TREE PLANTING IN PLANTER
1/B.09 (TREE PLANTING IN PLANTER) PER MAIN ST RECONSTRUCTION



5 CAST STONE SEATWALL
2/B.08 CAST STONE SEATWALL 'A' PER MAIN ST RECONSTRUCTION



6 STRUCTURAL SOIL
2/B.09 (STRUCTURAL SOIL) PER MAIN ST RECONSTRUCTION



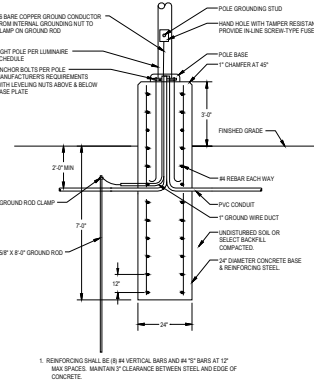
7 CONCRETE UNIT PAVERS
7/B.07 (CONCRETE UNIT PAVERS)
13/B.07 (PAVER PATTERN LAYOUT) PER MAIN ST RECONSTRUCTION

PATTERN 'B' BUILDING/LAWN

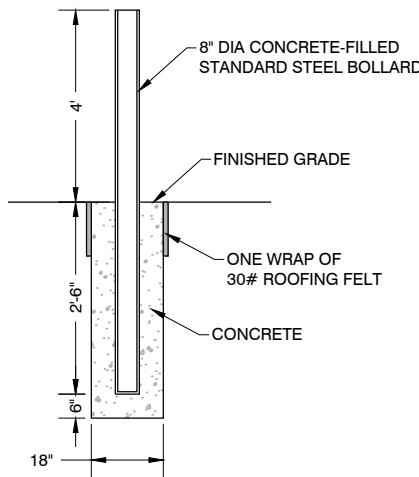


STREET

- PATTERN 'B' NOTES:
- PATTERN 'B' TO BE APPLIED ON ALL OTHER SIDEWALK PAVER AREAS, REFER TO K-SERIES SHEETS FOR LOCATIONS.
 - PAVER AREAS TO BE A MIX OF THE FOLLOWING, MATCHING THE INTENT OF THE PATTERN TO THE LEFT:
 - COLOR 1: FOSSIL
 - COLOR 2: BAVARIAN
 - COLOR 3: MIDNIGHT SKY



8 POLE BASE EXTENDED
3/P.07 (POLE BASE EXTENDED) PER MAIN ST RECONSTRUCTION



9 STEEL BOLLARD

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE

CGA
Clapsaddle-Garber Associates, Inc.
16 East Main Street
Marshalltown, Iowa 50158
Ph 641-752-4701
www.cgaconsultants.com

DESIGNED: _____	DATE: _____
DRAWN: _____	DATE: _____
CHECKED: _____	DATE: _____
APPROVED: _____	DATE: _____

MCSD WELCOME CENTER
MARSHALLTOWN, IOWA

DETAILS

PROJECT NO. 23-DS-0454
SHEET NO. C-501

GOVERNING SPECIFICATIONS

THE 2025 EDITION OF THE "IOWA STATEWIDE URBAN SPECIFICATIONS FOR PUBLIC IMPROVEMENTS" AND CITY OF MARSHALLTOWN SUPPLEMENTAL SPECIFICATIONS.

MUTCD 2023 AS ADOPTED BY IOWA DEPARTMENT OF TRANSPORTATION.

ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITHIN THE CONSTRUCTION OF THIS PROJECT.



NOTE: EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY IOWA ONE CALL 1-800-292-8989 OR 811

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

RESOURCE LIST

CITY OF MARSHALLTOWN

City Hall:
24 N Center Street
Marshalltown, IA 50158
(641) 754-5701

City Administrator:
Carol Webb

Mayor:
Joel Greer

City Council Members:
Mike Ladehoff
Mark Mitchell
Greg Nichols
Melisa Fonseca
Barry Kell
Jeff Schneider
Gary Thompson

Public Works Director:
Heather Thomas

Streets Superintendent:
Rick Legg
(641)-485-9540

UTILITIES

GAS & ENERGY:
Alliant Energy
Alliant Energy Field Engineer
(800) 255-4268

TELEPHONE:
Centurylink
Sadie Hull
(918) 547-0147

WATER:
Marshalltown Water Works
Zach Maxfield
(641) 753-7913

City of Marshalltown Sewer:
Troy McGahuey
(641) 751-9608

CABLE / INTERNET:
Mediacom
Curt Hodges
(515) 669-3647

Heart of Iowa Ventures:
Jay Duncan
(641) 486-2211

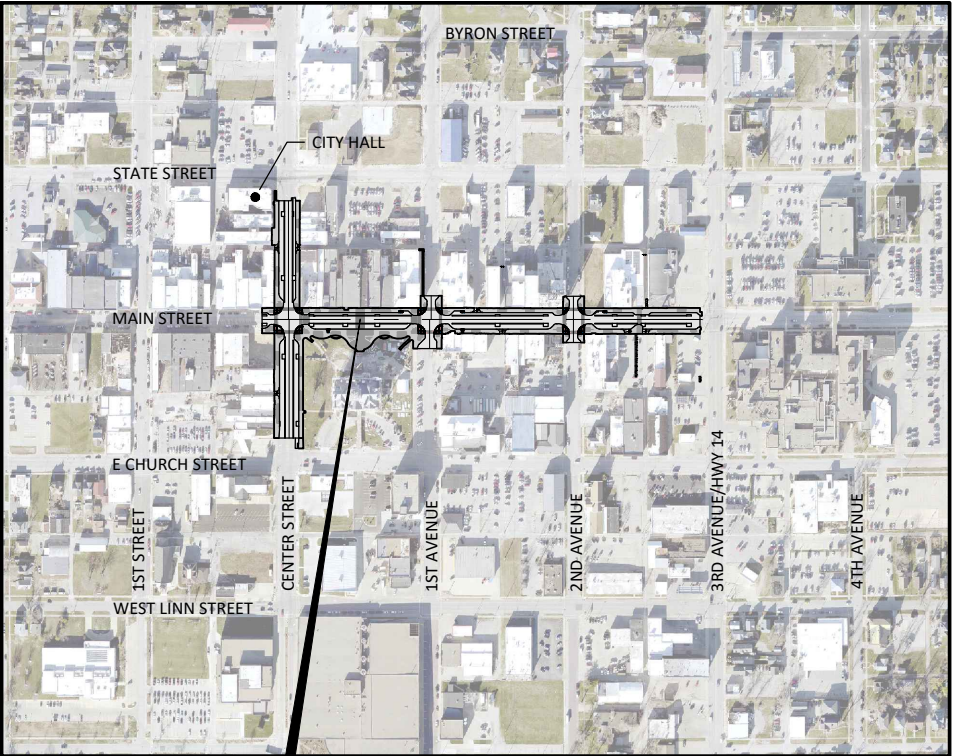
ELECTRIC:
City of Marshalltown
David Deemer
(641) 754-5734

CITY OF MARSHALLTOWN, IA

CONSTRUCTION PLANS FOR

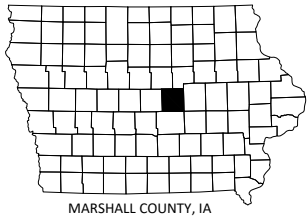
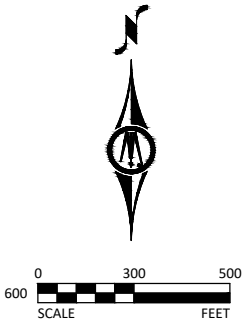
E. MAIN STREET/CENTER STREET
RECONSTRUCTION

CITY PROJECT NUMBER: STR-22-002
FEBRUARY 2025



PROJECT LOCATION

MAP OF THE
CITY OF MARSHALLTOWN
MARSHALL COUNTY, IA



SHEET NUMBER

SHEET TITLE

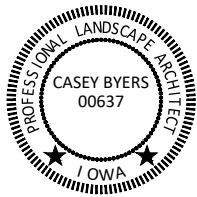
A.01 - A.02	TITLE SHEET, LEGEND SHEET
B.01 - B.14	TYPICAL SECTIONS & TYPICAL DETAILS
C.01 - C.21	QUANTITIES, ESTIMATE REFERENCE NOTES, & TABULATIONS
D.01 - D.05	PLAN & PROFILE - MAIN STREET
E.01 - E.04	PLAN & PROFILE - SIDE STREETS
F.01 - F.05	REMOVAL SHEETS
G.01 - G.02	REFERENCES & BENCHMARKS
H.01 - H.05	RIGHT-OF-WAY SHEETS
I.01 - I.11	IRRIGATION PLAN
J.01 - J.12	STAGING & TRAFFIC CONTROL SHEETS
K.00 - K.18	STREETSCAPE & LANDSCAPE PLANS
L1.01 - L1.09	INTERSECTION DETAIL SHEETS
L2.01 - L2.09	JOINING SHEETS
M1.01 - M1.11	STORM SEWER SHEETS
M2.01 - M2.07	WATERMAIN SHEETS
N.01 - N.06	PAVEMENT MARKING & SIGNAGE PLAN
P.01 - P.08	ELECTRICAL SHEETS
R.01 - R.05	EROSION CONTROL PLAN
S.01 - S.09	SIDEWALK SHEETS
V.00 - V.09	BUILDING VAULT SHEETS
W.01 - W.07	CROSS SECTIONS - MAIN STREET
X.01 - X.04	CROSS SECTIONS - CENTER STREET

THIS PLAN SET CONTAINS 185 SHEETS.

REVIEWED & APPROVED

Heather Thomas
PUBLIC WORKS DIRECTOR

DATE: **02/06/25**



I HEREBY CERTIFY THAT THE PORTION OF THIS TECHNICAL SUBMISSION DESCRIBED BELOW WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND RESPONSIBLE CHARGE. I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF IOWA.

CASEY BYERS, L.A.

LICENSE NUMBER: 00637 DATE: 02/05/2025

MY LICENSE RENEWAL DATE IS JUNE 30, 2025

PAGES OR SHEETS COVERED BY THIS SEAL:

B.07-B.11, I.01-I.11, K.00-K.18



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GREGORY A. BROUSSARD, P.E.

LICENSE NUMBER: P21974 DATE: 02/05/2025

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2025

PAGES OR SHEETS COVERED BY THIS SEAL:

A.01-B.06, C.01-H.05, J.01-J.12, L1.01-S.09, W.01-X.04

PLAN REVISIONS		
DATE	DESCRIPTION	APPROVED BY



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

GIDEON BODE, P.E.

LICENSE NUMBER: P29143 DATE: 02/05/2025

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2025

PAGES OR SHEETS COVERED BY THIS SEAL:

B.12-B.14



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& MENK**

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AMES, IOWA 50010
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Email: Ames@bolton-menk.com
www.bolton-menk.com

DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
CHECKED			
GAB			
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

TITLE SHEET

SHEET

A.01

EXISTING TOPOGRAPHIC SYMBOLS

	ACCESS GRATE		SATELLITE DISH
	AIR CONDITION UNIT		SIGN TRAFFIC
	ANTENNA		SIGNAL CONTROL CABINET
	AUTO SPRINKLER CONNECTION		SOIL BORING
	BARRICADE PERMANENT		SIREN
	BASKETBALL POST		TELEPHONE BOOTH
	BENCH		TILE INLET
	BIRD FEEDER		TILE OUTLET
	BOLLARD		TILE RISER
	BUSH		TRANSFORMER-ELECTRIC
	CATCH BASIN RECTANGULAR CASTING		TREE-CONIFEROUS
	CATCH BASIN CIRCULAR CASTING		TREE-DEAD
	CURB STOP		TREE-DECIDUOUS
	CLEAN OUT		TREE STUMP
	CULVERT END		TRAFFIC ARM BARRIER
	DRINKING FOUNTAIN		TRAFFIC SIGNAL
	DOWN SPOUT		TRASH CAN
	FILL PIPE		UTILITY MARKER
	FIRE HYDRANT		VALVE
	FLAG POLE		VALVE POST INDICATOR
	FLARED END / APRON		VALVE VAULT
	FUEL PUMP		VAULT
	GRILL		VENT PIPE
	GUY WIRE ANCHOR		WATER SPIGOT
	HANDHOLE		WELL
	HANDICAP SPACE		WETLAND DELINEATED MARKER
	IRRIGATION SPRINKLER HEAD		WETLAND
	IRRIGATION VALVE BOX		WET WELL
	LIFT STATION CONTROL PANEL		YARD HYDRANT
	LIFT STATION		
	LIGHT POLE		
	MAILBOX		
	MANHOLE-COMMUNICATION		
	MANHOLE-ELECTRIC		
	MANHOLE-GAS		
	MANHOLE-HEAT		
	MANHOLE-SANITARY SEWER		
	MANHOLE-STORM SEWER		
	MANHOLE-UTILITY		
	MANHOLE-WATER		
	METER		
	ORDER MICROPHONE		
	PARKING METER		
	PAVEMENT MARKING		
	PEDESTAL-COMMUNICATION		
	PEDESTAL-ELECTRIC		
	PEDESTRIAN PUSH BUTTON		
	PICNIC TABLE		
	POLE-UTILITY		
	POST		
	RAILROAD SIGNAL POLE		
	REGULATION STATION GAS		

PROPOSED TOPOGRAPHIC SYMBOLS

	CLEANOUT		FIRE HYDRANT
	MANHOLE		WATER VALVE
	LIFT STATION		WATER REDUCER
	STORM SEWER CIRCULAR CASTING		WATER BEND
	STORM SEWER RECTANGULAR CASTING		WATER TEE
	STORM SEWER FLARED END / APRON		WATER CROSS
	STORM SEWER OUTLET STRUCTURE		WATER SLEEVE
	STORM SEWER OVERFLOW STRUCTURE		WATER CAP / PLUG
	CURB BOX		RIP RAP
	FIRE HYDRANT		DRAINAGE FLOW
	WATER VALVE		TRAFFIC SIGNS
	WATER REDUCER		LIGHT POLE
	WATER BEND		
	WATER TEE		
	WATER CROSS		
	WATER SLEEVE		
	WATER CAP / PLUG		
	RIP RAP		
	DRAINAGE FLOW		
	TRAFFIC SIGNS		
	LIGHT POLE		

SURVEY SYMBOLS

	BENCHMARK LOCATION		CAST IRON MONUMENT
	CONTROL POINT		STONE MONUMENT
	MONUMENT FOUND		

EXISTING TOPOGRAPHIC LINES

	RETAINING WALL
	FENCE
	FENCE-DECORATIVE
	GUARD RAIL
	TREE LINE
	BUSH LINE

SURVEY LINES

	CONTROLLED ACCESS
	BOUNDARY
	CENTERLINE
	EXISTING EASEMENT LINE
	PROPOSED EASEMENT LINE
	EXISTING LOT LINE
	PROPOSED LOT LINE
	EXISTING RIGHT-OF-WAY
	PROPOSED RIGHT-OF-WAY
	SETBACK LINE
	SECTION LINE
	QUARTER LINE
	SIXTEENTH LINE
	TEMPORARY EASEMENT

EXISTING UTILITY LINES

	FORCEMAIN
	SANITARY SEWER
	SANITARY SERVICE
	STORM SEWER
	STORM SEWER DRAIN TILE
	WATERMAIN
	WATER SERVICE

PROPOSED UTILITY LINES

	FORCEMAIN
	SANITARY SEWER
	SANITARY SERVICE
	STORM SEWER
	STORM SEWER DRAIN TILE
	WATERMAIN
	WATER SERVICE
	PIPE CASING
	TRENCHLESS PIPE (PLAN VIEW)
	TRENCHLESS PIPE (PROFILE VIEW)

GRADING INFORMATION

	EXISTING CONTOUR MINOR
	EXISTING CONTOUR MAJOR
	PROPOSED CONTOUR MINOR
	PROPOSED CONTOUR MAJOR
	PROPOSED GRADING LIMITS / SLOPE LIMITS
	PROJECT LIMITS
	PROPOSED SPOT ELEVATION
	RISE:RUN (SLOPE)

EXISTING PRIVATE UTILITY LINES

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THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA"

	UNDERGROUND FIBER OPTIC
	UNDERGROUND ELECTRIC
	UNDERGROUND GAS
	UNDERGROUND COMMUNICATION
	OVERHEAD ELECTRIC
	OVERHEAD COMMUNICATION
	OVERHEAD UTILITY

UTILITIES IDENTIFIED WITH A QUALITY LEVEL OTHER THAN D:

LINE TYPES FOLLOW THE FORMAT: UTILITY TYPE - QUALITY LEVEL
EXAMPLE: G-A G-A UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-02.

UTILITY QUALITY LEVELS:

LEVEL D - INFORMATION COMES SOLELY FROM EXISTING UTILITY RECORDS.

LEVEL C - SURVEYING ABOVE GROUND UTILITY FACILITIES, SUCH AS MANHOLES, VALVE BOXES, ETC; AND CORRELATING THIS INFORMATION WITH EXISTING UTILITY RECORDS.

LEVEL B - THE USE OF SURFACE GEOPHYSICAL TECHNIQUES TO DETERMINE THE EXISTENCE AND HORIZONTAL POSITION OF UNDERGROUND UTILITIES.

LEVEL A - THE USE OF NONDESTRUCTIVE DIGGING EQUIPMENT AT HORIZONTAL AND VERTICAL POSITION OF UNDERGROUND UTILITIES, AS WELL AS THE TYPE, SIZE, CONDITION, MATERIAL, AND OTHER CHARACTERISTICS.

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE	GV	GATE VALVE	RT	RIGHT
ADJ	ADJUST	HDPE	HIGH DENSITY POLYETHYLENE	SAN	SANITARY SEWER
ALT	ALTERNATE	HH	HANDHOLE	SCH	SCHEDULE
B-B	BACK TO BACK	HMA	HOT MIX ASPHALT	SERV	SERVICE
BLDG	BUILDING	HP	HIGH POINT	SHLD	SHOULDER
BMP	BEST MANAGEMENT PRACTICE	HWL	HIGH WATER LEVEL	STA	STATION
BR	BEGIN RADIUS	HYD	HYDRANT	STD	STANDARD
BV	BUTTERFLY VALVE	I	INVERT	STM	STORM SEWER
CB	CATCH BASIN	K	CURVE COEFFICIENT	TC	TOP OF CURB
C&G	CURB AND GUTTER	L	LENGTH	TE	TEMPORARY EASEMENT
CIP	CAST IRON PIPE	LO	LOWEST OPENING	TEMP	TEMPORARY
CIPP	CURED-IN-PLACE PIPE	LP	LOW POINT	TNH	TOP NUT HYDRANT
CL	CENTER LINE	LT	LEFT	TP	TOP OF PIPE
CL	CLASS	MH	MANHOLE	TYP	TYPICAL
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	VCP	VITRIFIED CLAY PIPE
C.O.	CHANGE ORDER	MPW	MUSCATINE POWER & WATER	VERT	VERTICAL
COMM	COMMUNICATION	MR	MID RADIUS	VPC	VERTICAL POINT OF CURVE
CSP	CORRUGATED STEEL PIPE	NIC	NOT IN CONTRACT	VPI	VERTICAL POINT OF INTERSECTION
CLVT	CULVERT	NMC	NON-METALLIC CONDUIT	VPT	VERTICAL POINT OF TANGENT
DIA	DIAMETER	NTS	NOT TO SCALE	WM	WATERMAIN
DIP	DUCTILE IRON PIPE	NWL	NORMAL WATER LEVEL	WS	WATER SERVICE
DWY	DRIVEWAY	OHW	ORDINARY HIGH WATER LEVEL		
E	EXTERNAL CURVE DISTANCE	PC	POINT OF CURVE		
ESMT	EASEMENT	PCC	PORTLAND CEMENT CONCRETE	AC	ACRES
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CF	CUBIC FEET
ELEV/EL	ELEVATION	PED	PEDESTRIAN, PEDESTAL	CV	COMPACTED VOLUME
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	CY	CUBIC YARD
ER	END RADIUS	PERM	PERMANENT	EA	EACH
EX	EXISTING	PI	POINT OF INTERSECTION	EV	EXCAVATED VOLUME
FES	FLARED END SECTION	PL	PROPERTY LINE	LB	POUND
F-F	FACE TO FACE	PRC	POINT OF REVERSE CURVE	LF	LINEAR FEET
FF	FINISHED FLOOR	PT	POINT OF TANGENT	LS	LUMP SUM
F&I	FURNISH AND INSTALL	PVC	POLYVINYL CHLORIDE PIPE	LV	LOOSE VOLUME
FM	FORCEMAIN	PVMT	PAVEMENT	SF	SQUARE FEET
FO	FIBER OPTIC	R	RADIUS	SV	STOCKPILE VOLUME
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE	SY	SQUARE YARD
GRAN	GRANULAR	RET	RETAINING		
GRAV	GRAVEL	R/W	RIGHT-OF-WAY		
GU	GUTTER	RSC	RIGID STEEL CONDUIT		



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DESIGNED	REV	DESCRIPTION	DATE
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DRAWN			
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GAB			
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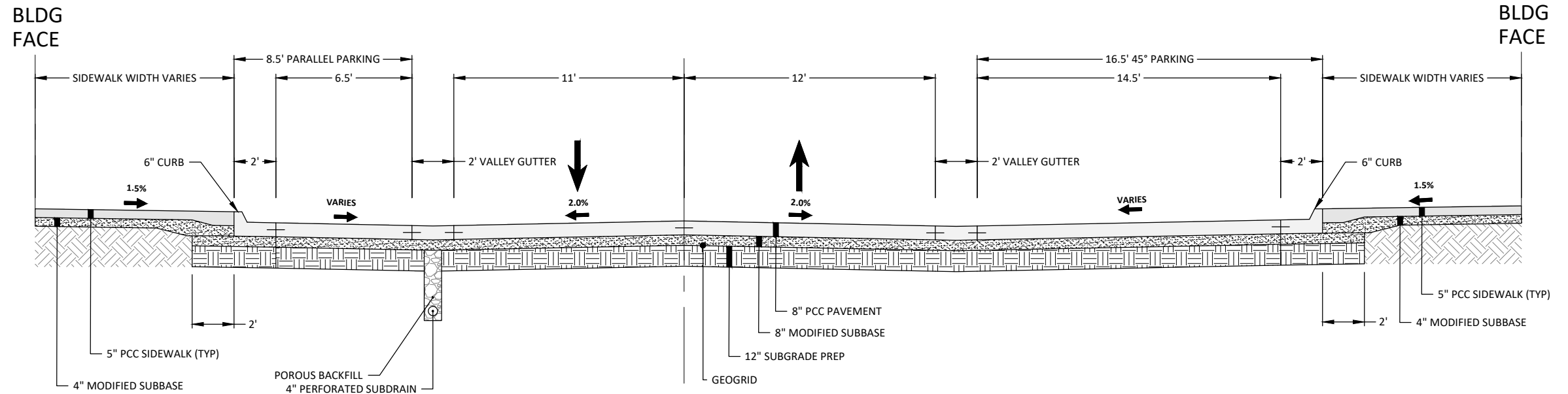
CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

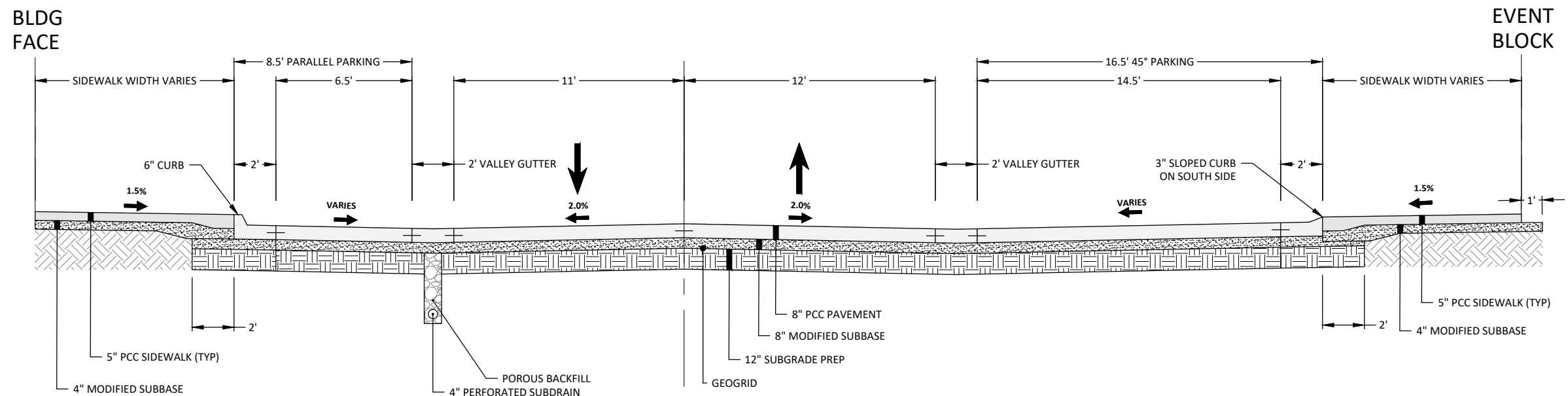
LEGEND SHEET

SHEET

A.02



1
B.01
MAIN STREET, EAST OF 1ST AVE TYPICAL SECTION
NOT TO SCALE



2
B.01
MAIN STREET, CENTER ST TO 1ST AVE TYPICAL SECTION
NOT TO SCALE

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A:\WORK\122221\122221\122221\122221.dwg 2/5/2025 10:15:13 AM

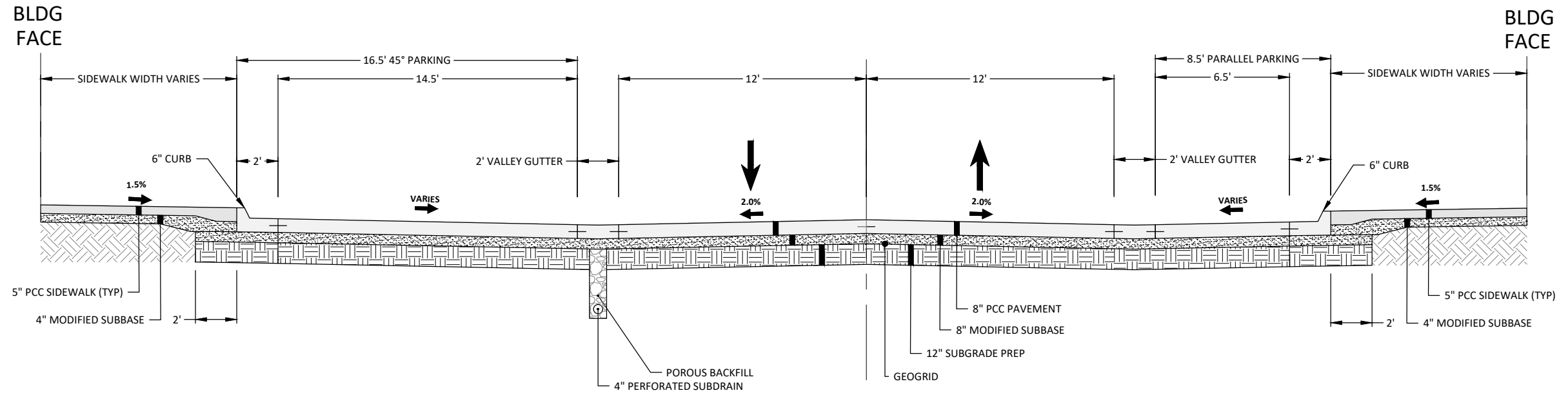


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AMES, IOWA 50010
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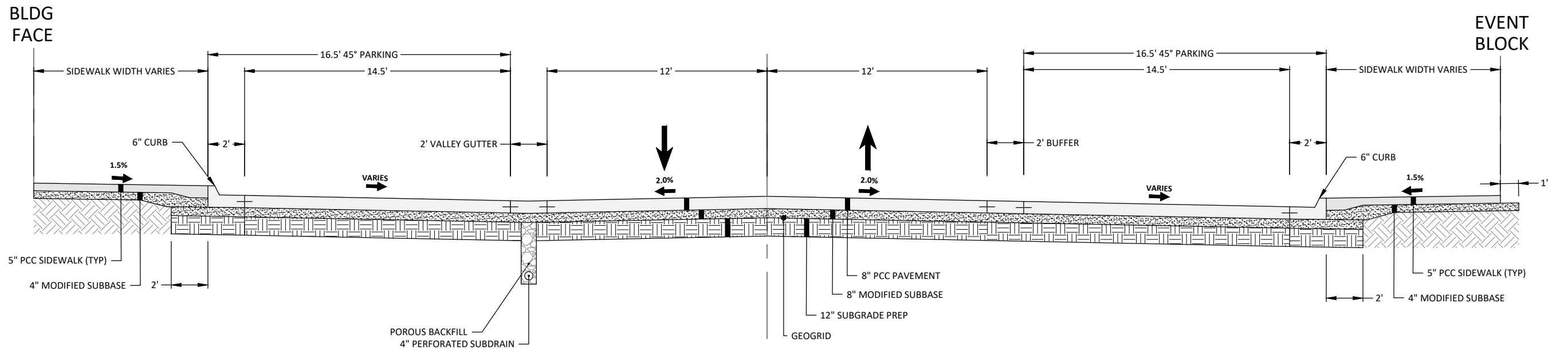
DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
DEM			
CHECKED			
GAB			
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
TYPICAL SECTIONS

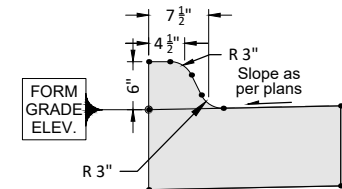
SHEET
B.01



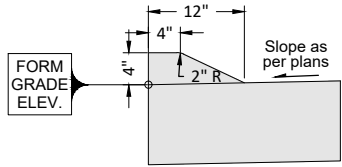
1 NORTH CENTER STREET TYPICAL SECTION
B.02 NOT TO SCALE



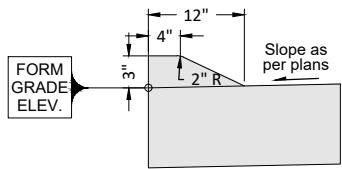
2 SOUTH CENTER STREET TYPICAL SECTION
B.02 NOT TO SCALE



6" STANDARD CURB

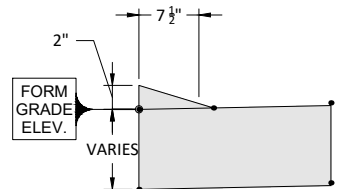


4" SLOPED CURB

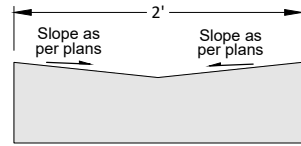


3" SLOPED CURB

1 CURB TYPICALS
B.03 NOT TO SCALE

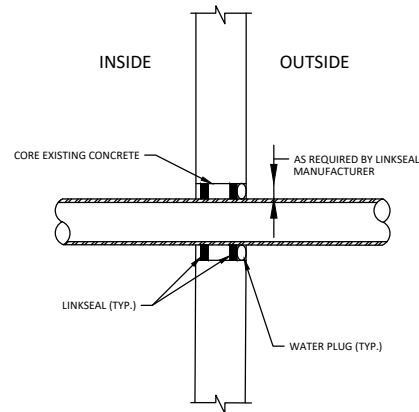


DRIVEWAY DROP CURB



VALLEY GUTTER

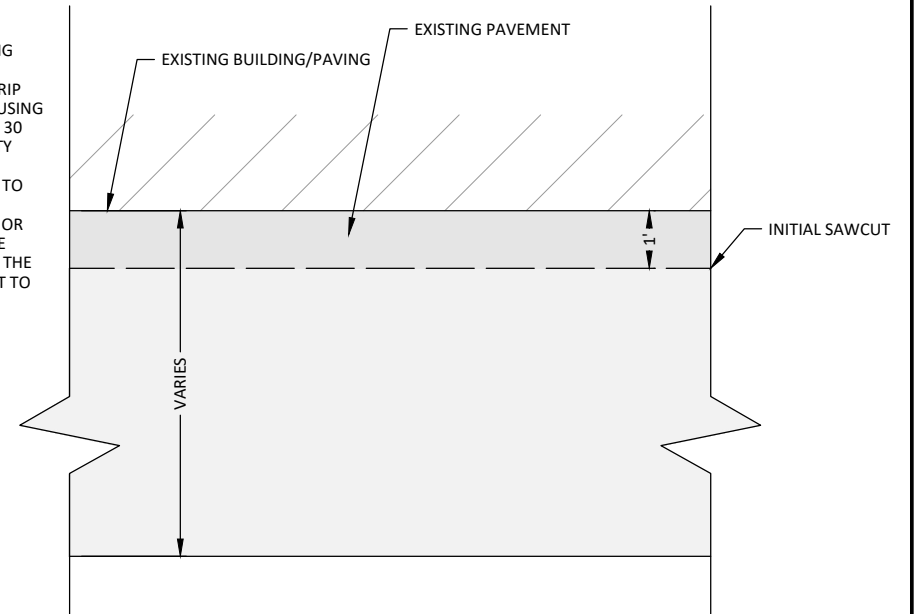
* VALLEY GUTTER SHALL BE POURED
AS INTEGRAL TO MAINLINE PAVING



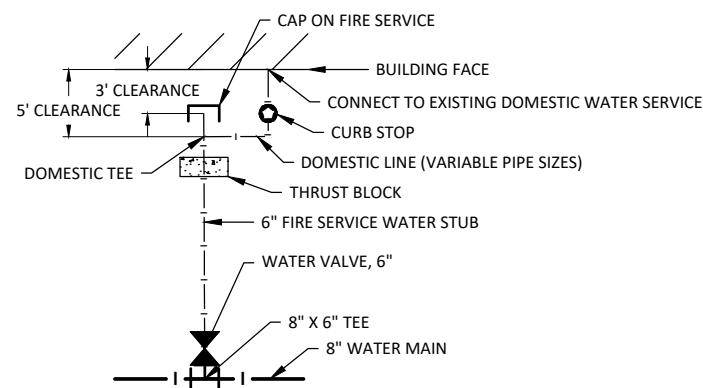
2 WALL PIPES IN EXISTING STRUCTURES
B.03 NOT TO SCALE

PAVEMENT REMOVAL PROCESS

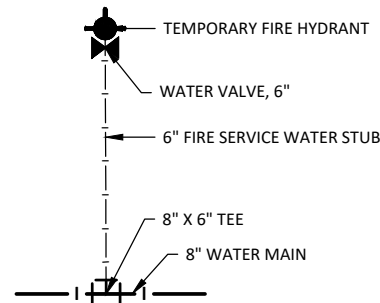
1. FULL DEPTH SAWCUT 1' FROM BUILDING FACE OR EXISTING PAVEMENT
2. REMOVE PAVEMENT OUTSIDE OF 1' STRIP
3. REMOVE 1' OF REMAINING MATERIAL USING HAND-HELD JACK HAMMER WEIGHING 30 POUNDS OR LESS OR OTHER LIGHT DUTY EQUIPMENT WHICH WILL NOT CAUSE DISTRESS ON BUILDING OR PAVEMENT TO REMAIN.
4. ANY DAMAGE TO EXISTING BUILDINGS OR ENTRYWAYS INCLUDING TILES SHALL BE RESTORED TO EXISTING CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT



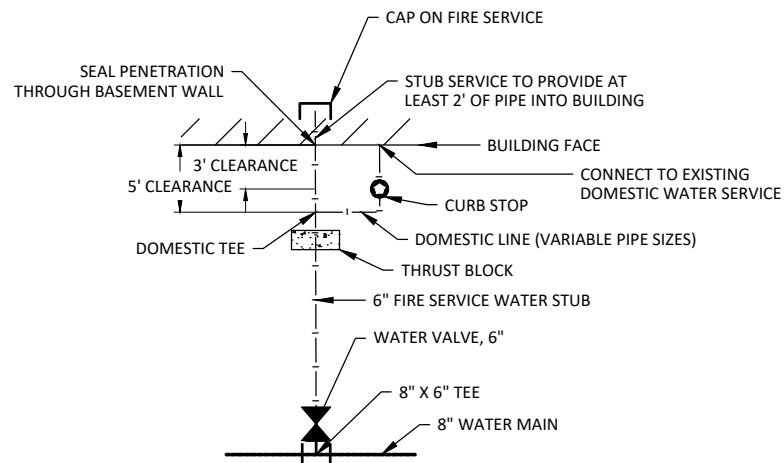
3 PAVEMENT REMOVAL ADJACENT TO BUILDING
B.03 NOT TO SCALE



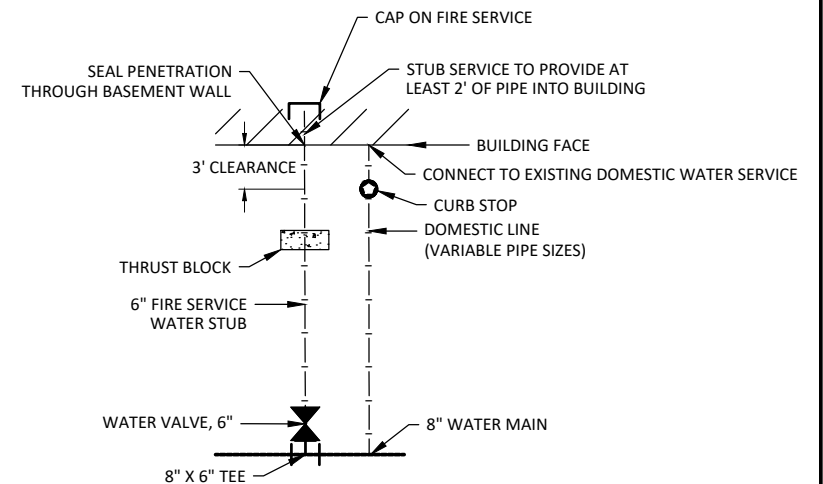
4 EXTERNAL FIRE SERVICE
B.03 NOT TO SCALE



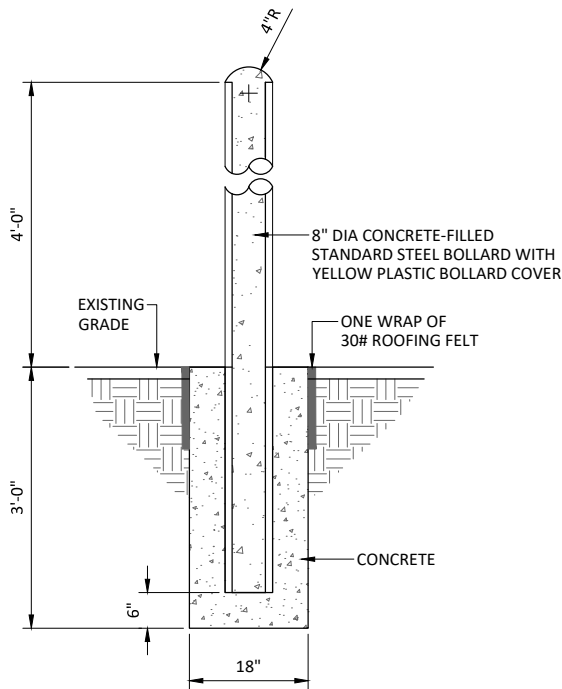
5 FUTURE FIRE SERVICE WITH TEMPORARY HYDRANT
B.03 NOT TO SCALE



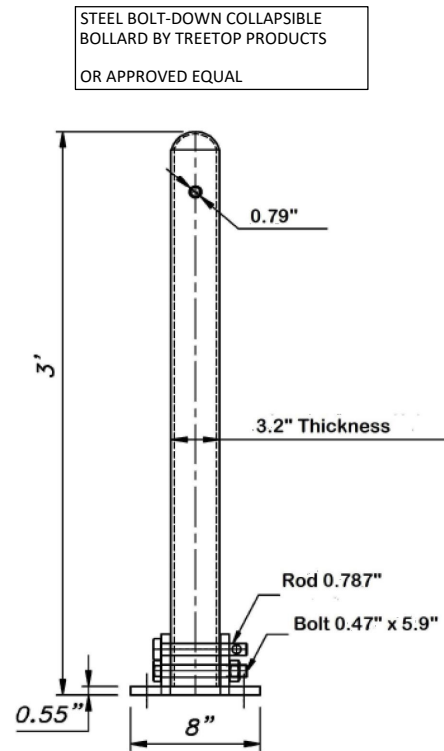
6 INTERNAL FIRE SERVICE WITH DOMESTIC SERVICE
B.03 NOT TO SCALE



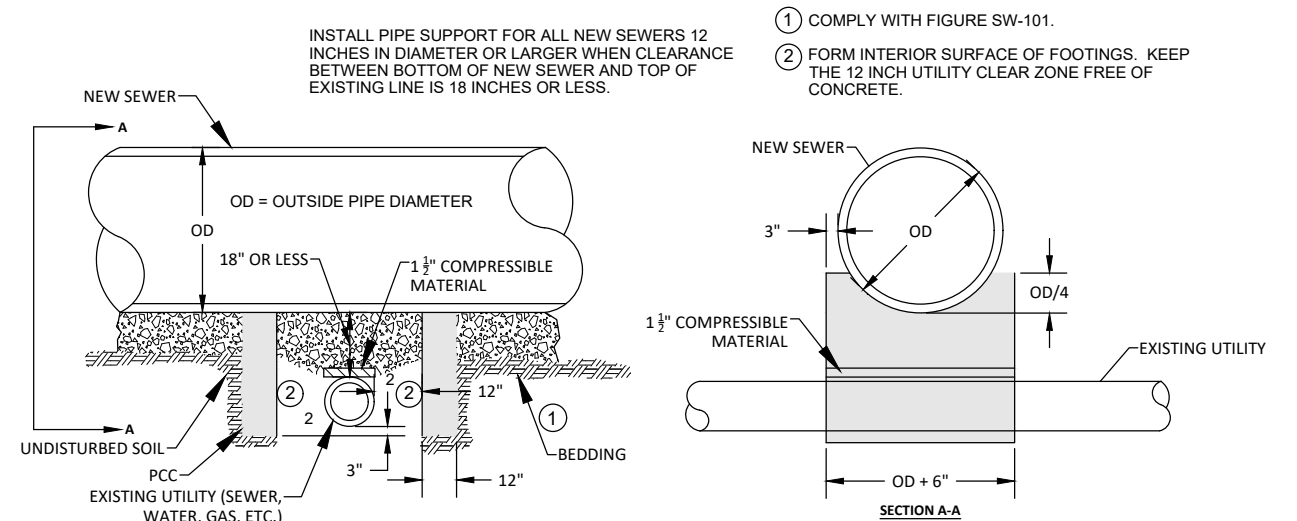
7 INTERNAL FIRE SERVICE
B.03 NOT TO SCALE



1
B.04 NON-REMOVABLE BOLLARD
NOT TO SCALE

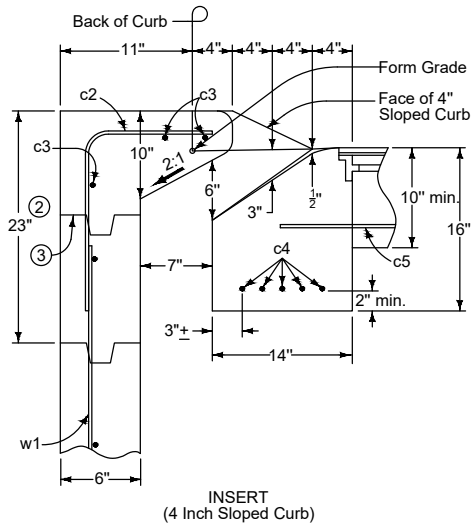
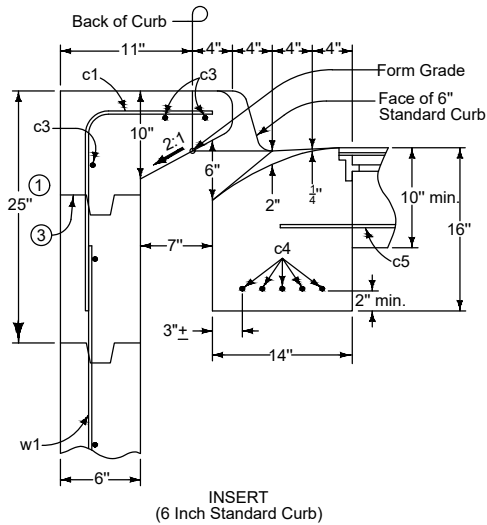


2
B.04 COLLAPSIBLE BOLLARD
NOT TO SCALE



3
B.04 CROSSING PIPE SUPPORT
NOT TO SCALE

FIGURE 6010.541 SHEET 1 OF 2

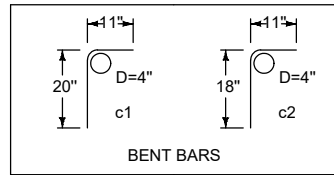
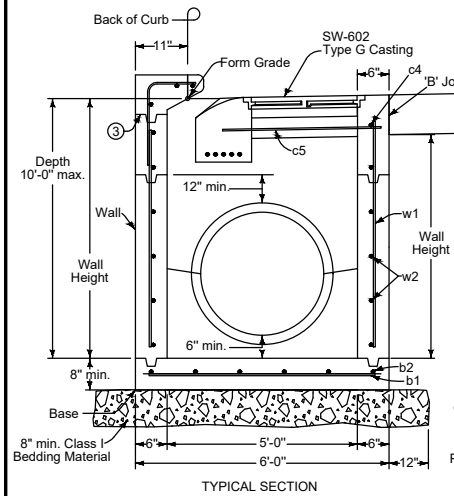


- ① 39 inches when attaching the SW-542 extension unit.
② 37 inches when attaching the SW-542 extension unit.
③ Additional keyed construction joint when attaching the SW-542 extension unit.

MODIFIED

FIGURE 6010.541	STANDARD ROAD PLAN	REVISION 5 04-21-20 SW-541
SHEET 1 of 2		
REVISIONS: Changed well walls to 6 inch reinforced. Modified TYPICAL SECTION and c1 and c2 bar lengths. Added note 4. Added Class 1 bedding material.		
SUDAS DIRECTOR DESIGN METHODS ENGINEER		
OPEN-THROAT CURB INTAKE UNDER PAVEMENT		

FIGURE 6010.541 SHEET 2 OF 2



REINFORCING BAR LIST					
Mark	Size	Location	Shape	Length	Spacing
b1	4	Base	—	5'-6"	11"
b2	4	Base	—	5'-6"	11"
w1	4	Wall	—	Wall Height minus 4"	14"
w2	4	Wall	—	4'-8"	12"
c1	4	Top	⌋	2'-7"	14"
c2	4	Top	⌋	2'-5"	14"
c3	4	Top	—	4'-8"	See Detail
c4	4	Top	—	4'-8"	See Detail
c5	4	Top	—	3'-2"	See Detail

MAXIMUM PIPE DIAMETER	
Precast	30"
Cast-in-Place	36"

- For joint details, refer to PV-101.
③ Additional keyed construction joint when attaching the SW-542 extension unit.
④ Top of well flush with pavement.

MODIFIED

FIGURE 6010.541	STANDARD ROAD PLAN	REVISION 5 04-21-20 SW-541
SHEET 2 of 2		
REVISIONS: Changed well walls to 6 inch reinforced. Modified TYPICAL SECTION and c1 and c2 bar lengths. Added note 4. Added Class 1 bedding material.		
SUDAS DIRECTOR DESIGN METHODS ENGINEER		
OPEN-THROAT CURB INTAKE UNDER PAVEMENT		

1
B.05 SW-541 MODIFIED
NOT TO SCALE

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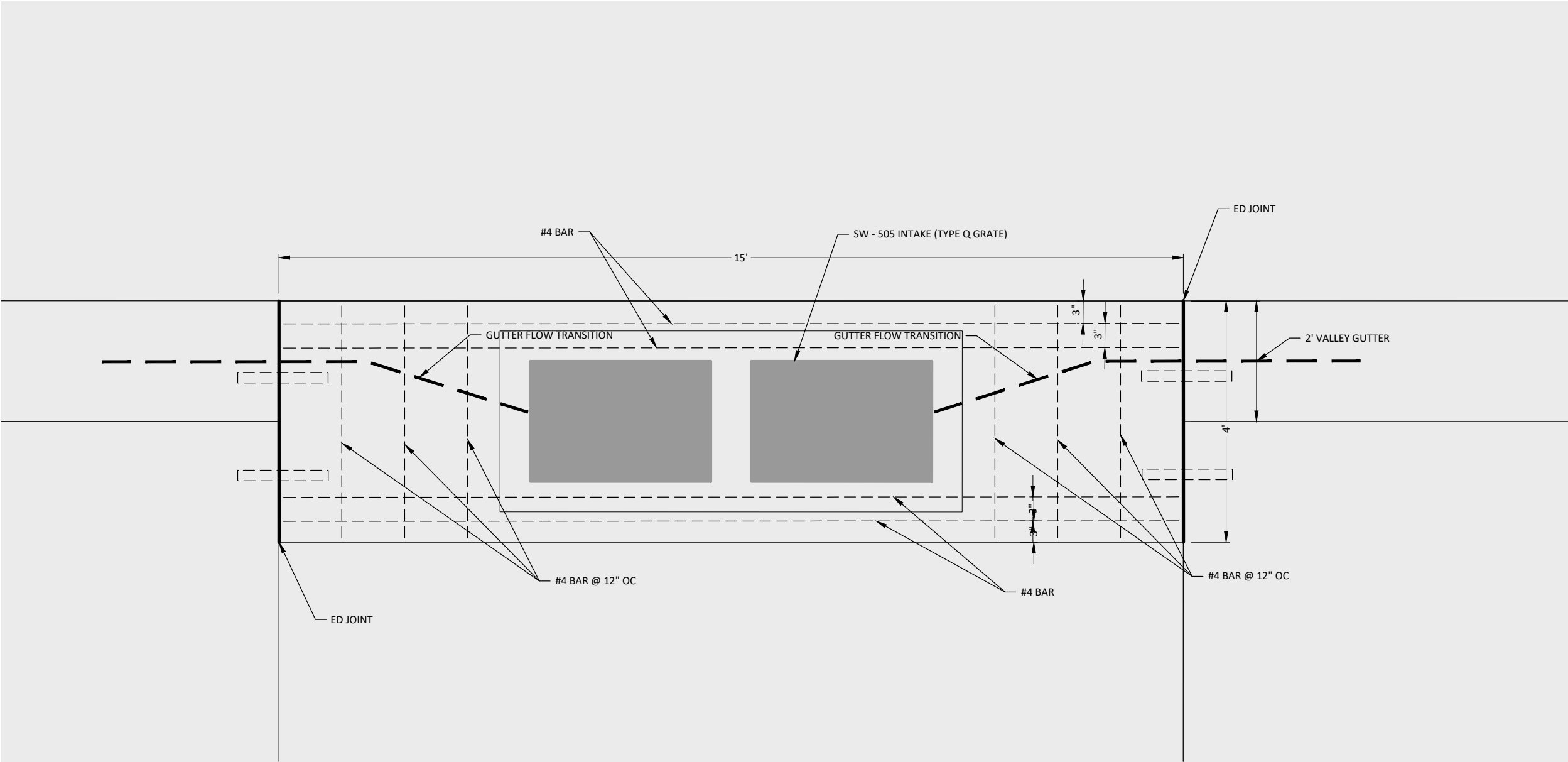


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DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
CHECKED			
GAB			
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
TYPICAL DETAILS

SHEET
B.05



1 SW-505 (TYPE Q GRATE) BOX OUT
B.06 NOT TO SCALE

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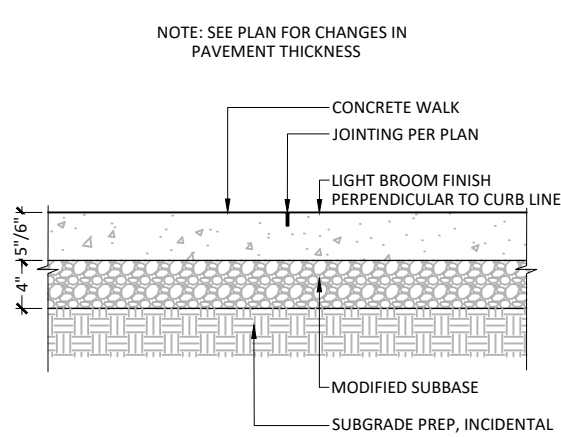
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STORM INTAKE BOX OUT

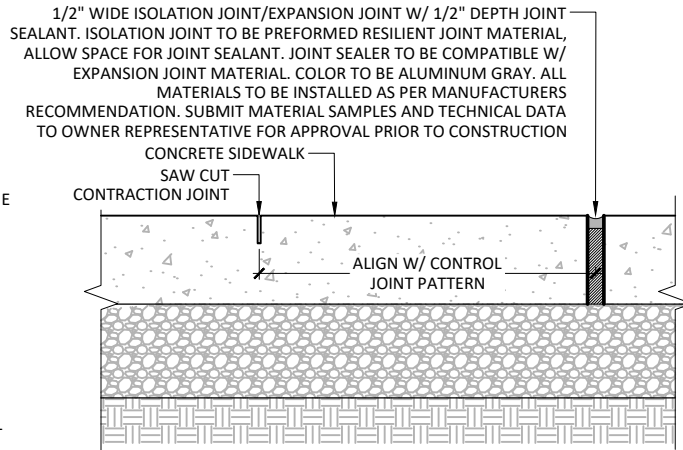
SHEET

B.06

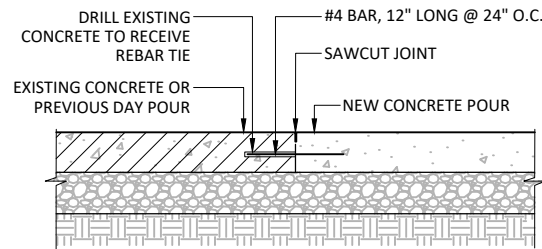
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MARSHALLTOWN, IA 52501
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DATE: 2/5/2025 10:15:38 AM



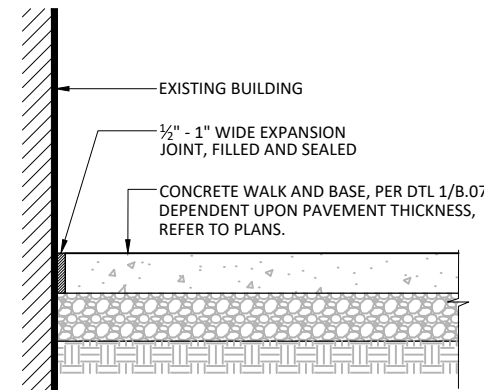
1 SIDEWALK, PCC
SCALE: N.T.S.



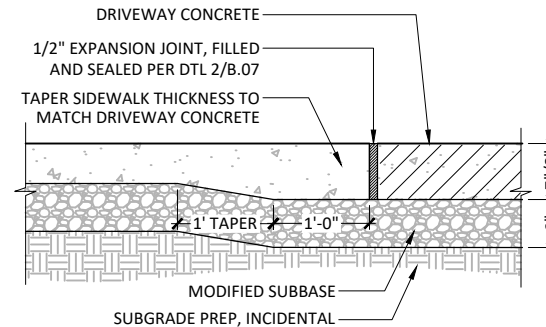
2 CONCRETE SIDEWALK JOINTS
SCALE: N.T.S.



3 SIDEWALK REINFORCED CONSTRUCTION JOINT
SCALE: N.T.S.

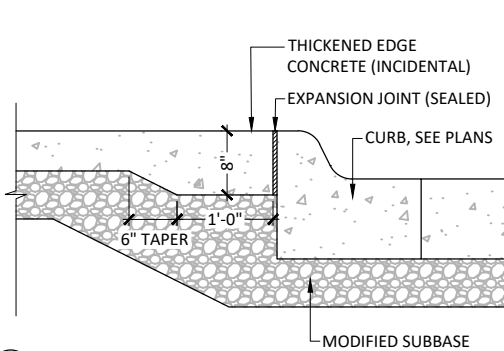


4 CONCRETE SIDEWALK AT BUILDING
SCALE: N.T.S.

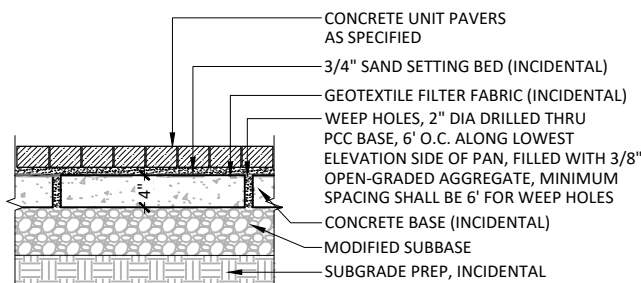


5 SIDEWALK TO DRIVEWAY CONNECTION
SCALE: N.T.S.

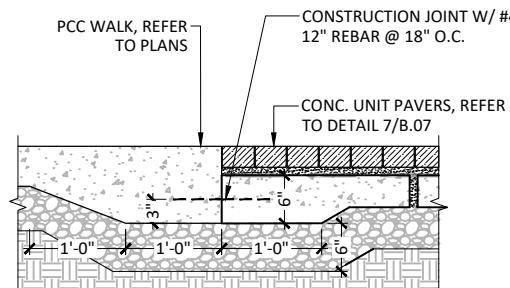
- PAVER NOTES:**
- REFER TO SHEET K.00 FOR PAVER PRODUCT INFORMATION
 - VERTICAL TOLERANCE SHALL BE 1/8"
 - HORIZONTAL TOLERANCE SHALL BE 3/16"



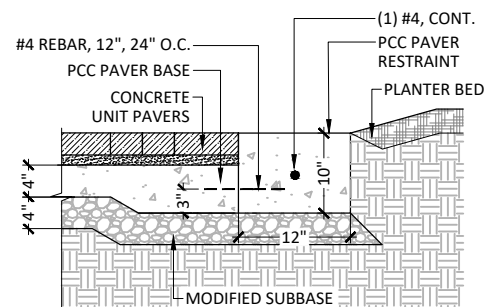
6 SIDEWALK AT CURB
SCALE: N.T.S.



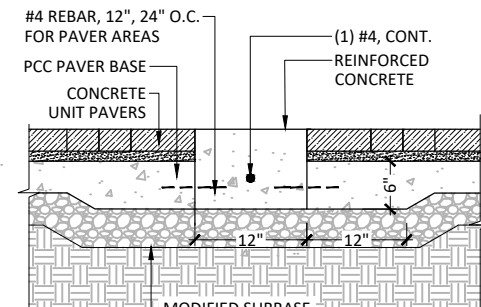
7 SIDEWALK CONCRETE UNIT PAVERS
SCALE: N.T.S.



8 THICKENED SIDEWALK EDGE AT SIDEWALK PAVERS
SCALE: N.T.S.



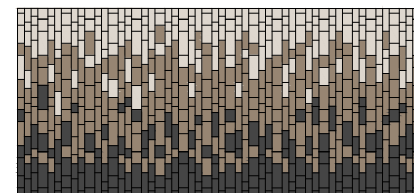
A. BAND BETWEEN PAVERS AND PLANTING BED



B. BAND BETWEEN PAVERS

9 REINFORCED CONCRETE BAND (INCIDENTAL TO SIDEWALK)
SCALE: N.T.S.

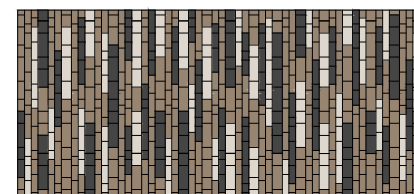
PATTERN 'A' BUILDING/LAWN



- PATTERN 'A' NOTES:**
- PATTERN 'A' TO BE APPLIED ON EVENT BLOCK SIDEWALK AREAS, REFER TO K-SERIES SHEETS FOR LOCATIONS.
 - PAVER AREAS TO BE A MIX OF THE FOLLOWING, MATCHING THE INTENT OF THE PATTERN TO THE LEFT:
 - COLOR 1: FOSSIL
 - COLOR 2: BAVARIAN
 - COLOR 3: MIDNIGHT SKY

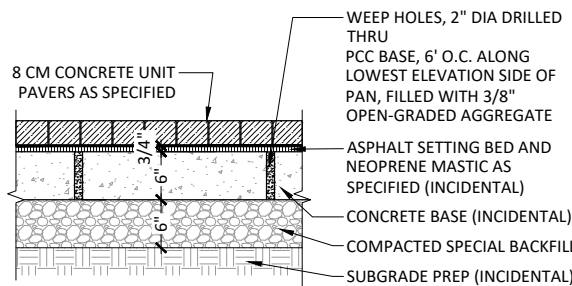
STREET

PATTERN 'B' BUILDING/LAWN

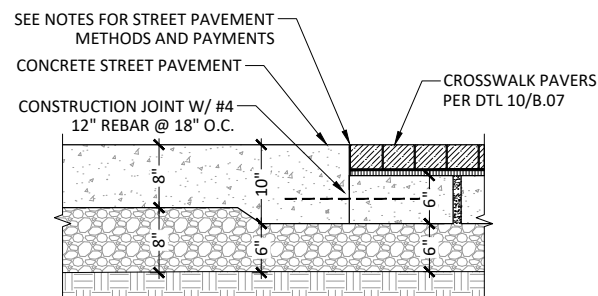


- PATTERN 'B' NOTES:**
- PATTERN 'B' TO BE APPLIED ON ALL OTHER SIDEWALK PAVER AREAS, REFER TO K-SERIES SHEETS FOR LOCATIONS.
 - PAVER AREAS TO BE A MIX OF THE FOLLOWING, MATCHING THE INTENT OF THE PATTERN TO THE LEFT:
 - COLOR 1: FOSSIL
 - COLOR 2: BAVARIAN
 - COLOR 3: MIDNIGHT SKY

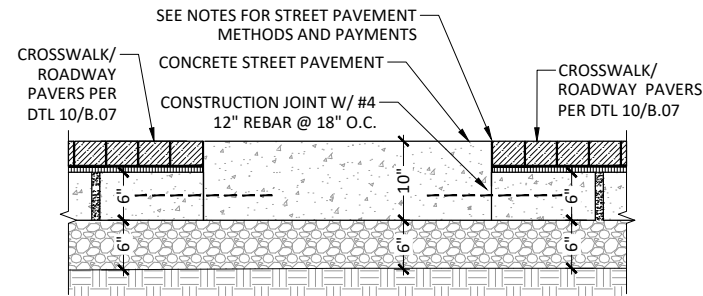
STREET



10 ROADWAY CROSSWALK PAVERS
SCALE: N.T.S.



11 ROADWAY/CROSSWALK PAVERS AND ROADWAY INTERFACE
SCALE: N.T.S.



12 ROADWAY PAVER AND CROSSWALK PAVER INTERFACE
SCALE: N.T.S.

13 PAVER PATTERN LAYOUT
SCALE: N.T.S.



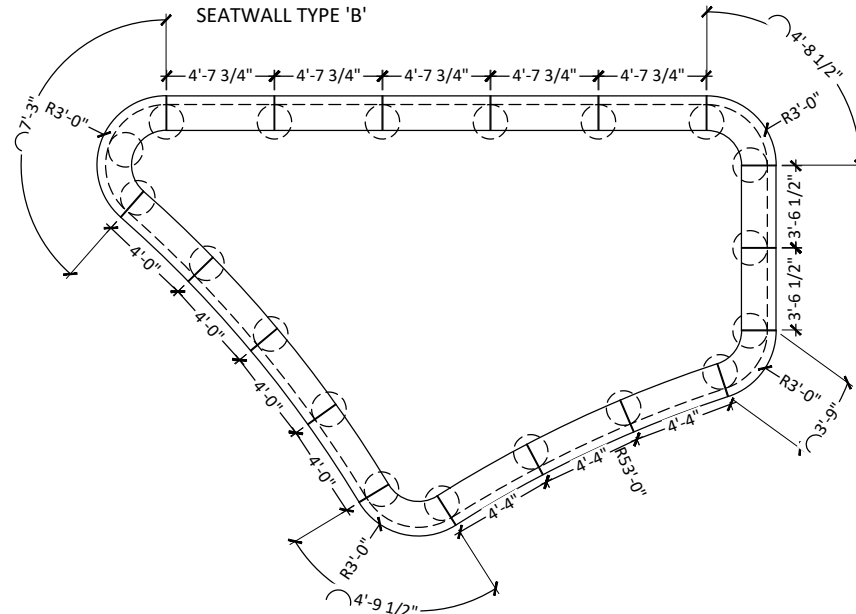
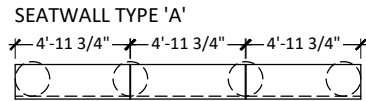
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STREETSCAPE DETAILS

SHEET

B.07



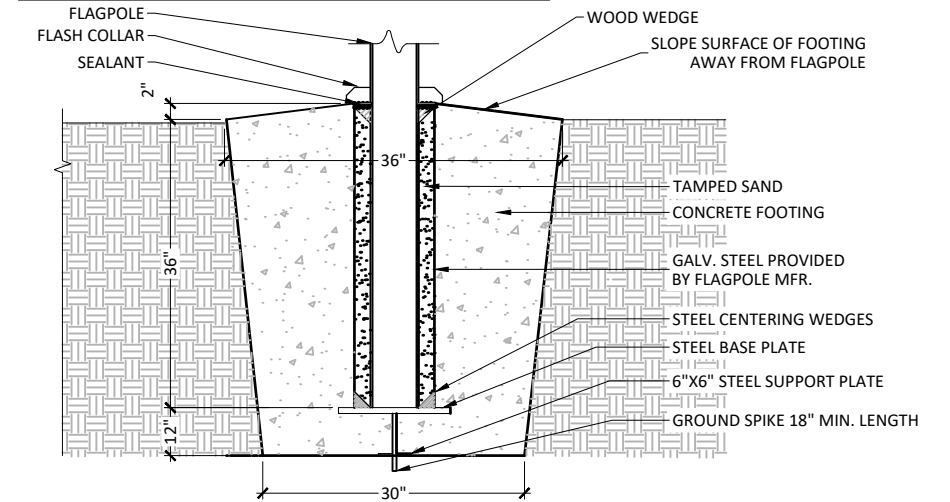
SEATWALL NOTES:

- CAST STONE TO BE SMOOTH FINISH, BUFF COLOR. CONTRACTOR SHALL SUBMIT SAMPLES FOR ENGINEER REVIEW AND APPROVAL.
- CAST STONE SECTION LENGTHS AND FOOTING LOCATIONS ARE FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW AND APPROVAL.
- SEATWALLS TO BE LEVEL ON TOP, 18" MIN. HEIGHT FROM FINISH GRADE.
- MANUFACTURER SHALL BE EDWARDS CAST STONE, DUBUQUE, IOWA – OR APPROVED EQUAL.

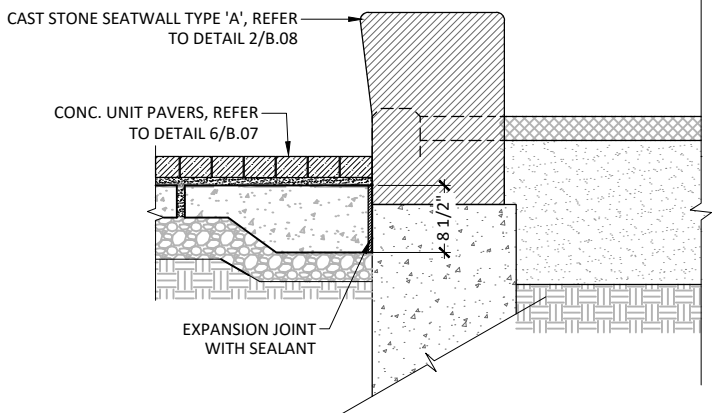
FLAGPOLE PRODUCT INFO:
30" HEIGHT X 6" DIAMETER X 0.188" WALL THICKNESS, 120 MPH WIND SPEED, INTERNAL HALYARD, GOLD BALL TOP ORNAMENT

SENTRY MODEL, THE FLAGPOLE COMPANY, CONTACT: 800-805-9728

OR APPROVED EQUAL

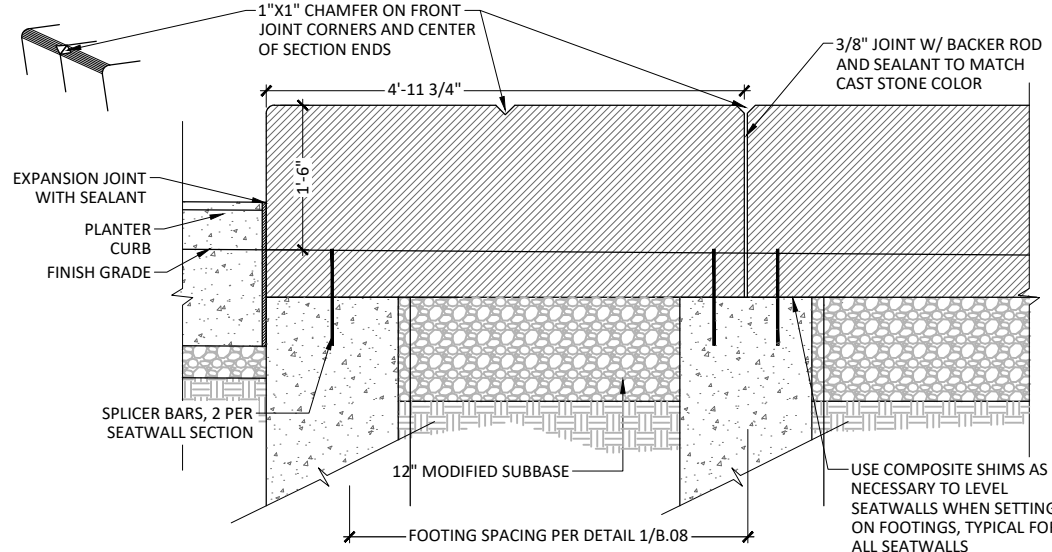
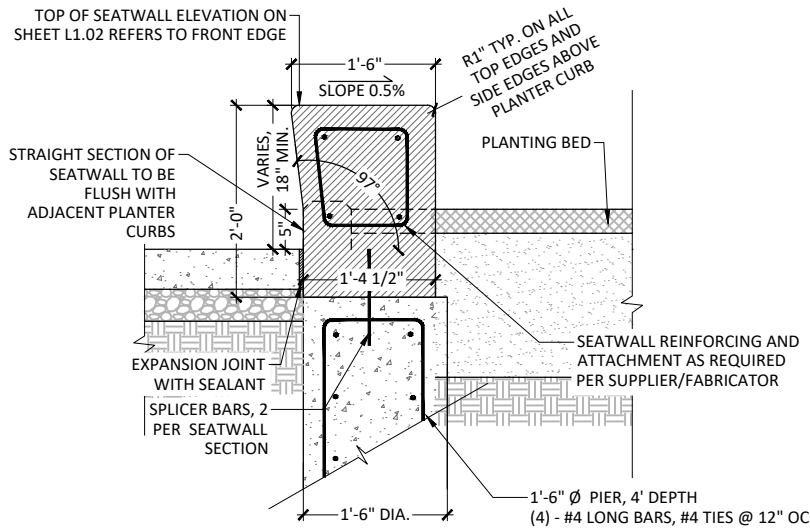


4 FLAGPOLE FOOTING SCALE: N.T.S.

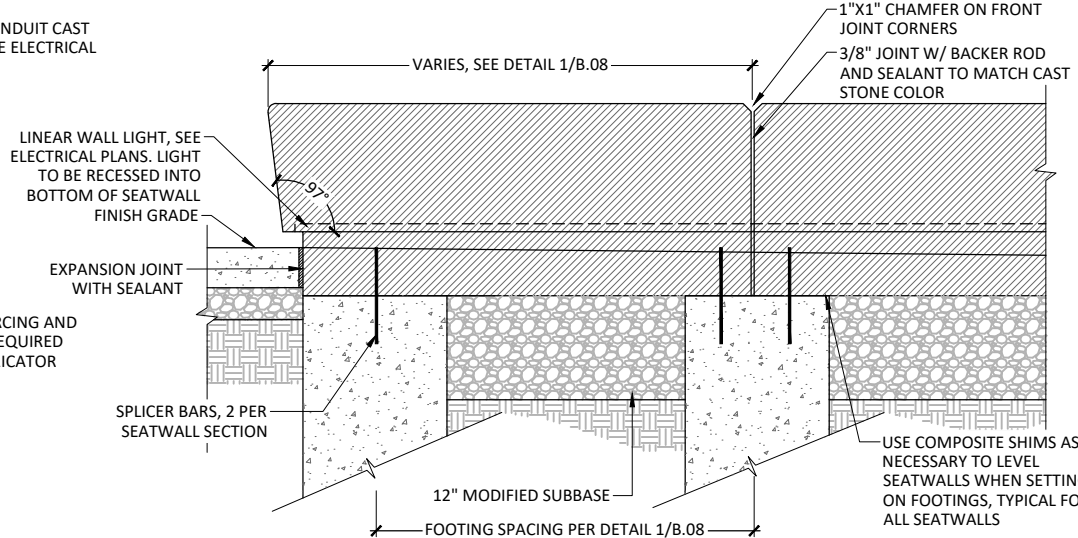
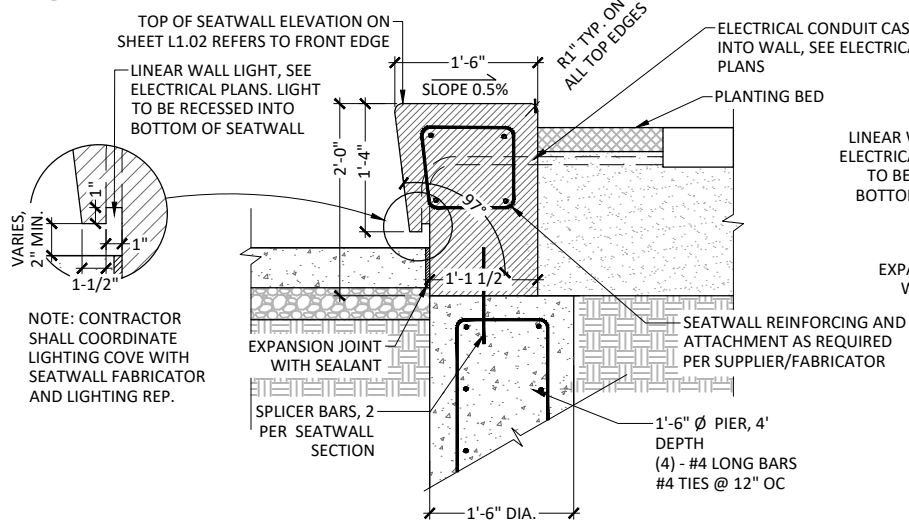


5 SIDEWALK PAVER AND CAST STONE SEATWALL INTERFACE SCALE: N.T.S.

1 CAST STONE SEATWALL PLAN LAYOUTS SCALE: N.T.S.



2 CAST STONE SEATWALL TYPE 'A' SCALE: N.T.S.



3 CAST STONE SEATWALL TYPE 'B' SCALE: N.T.S.

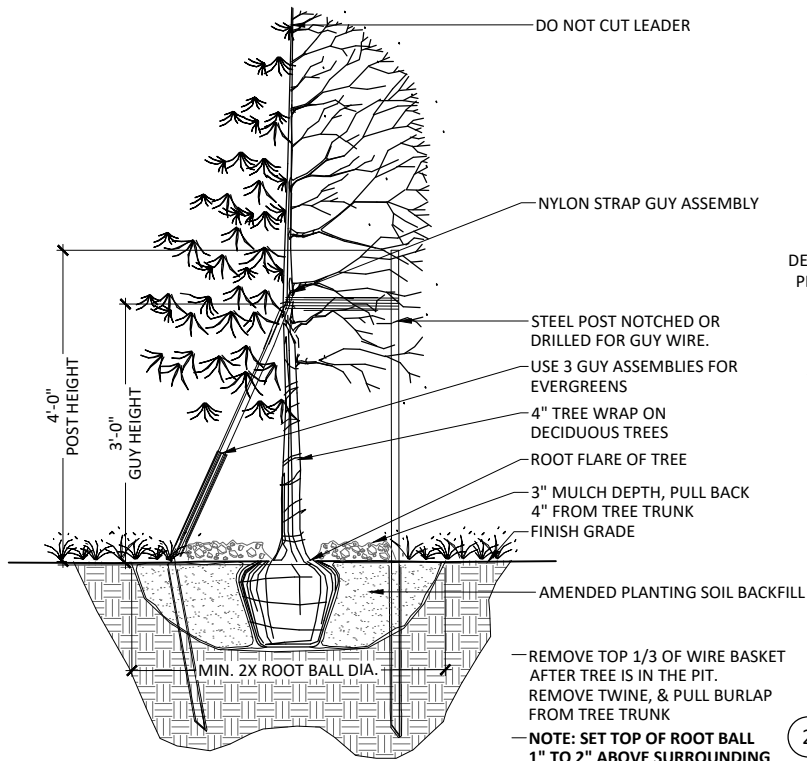


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CHECKED	GAB		
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STREETSCAPE DETAILS

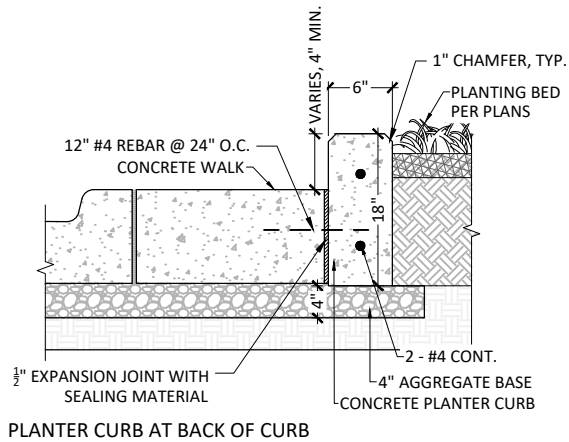
SHEET
B.08



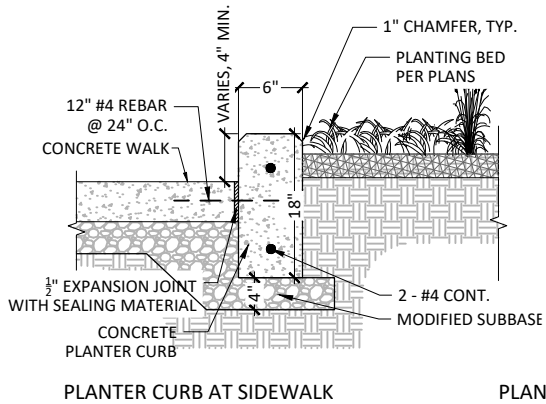
1 TREE PLANTING IN PLANTER
SCALE: N.T.S.

2 STRUCTURAL SOIL
SCALE: N.T.S.

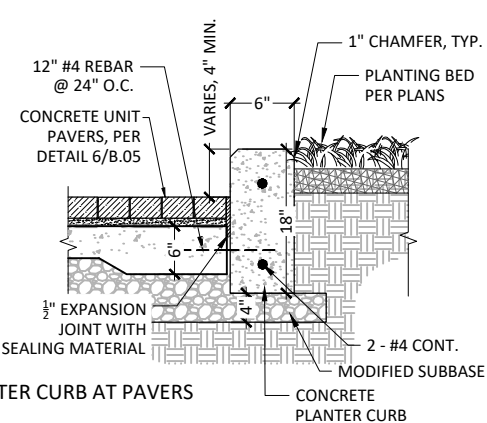
NOTES:
- 4' O.C. MAX. CONTROL JOINT SPACING
- 4" MIN./STANDARD HEIGHT. HEIGHT MAY INCREASE TO ACCOUNT FOR SIDEWALK SLOPE. TOP OF CURB SHALL BE LEVEL WHERE PARALLEL TO STREET EXCEPT WHERE HEIGHT OF CURB EXCEEDS 8", THEN SLOPE SHALL MATCH SIDEWALK
- PERPENDICULAR RUNS SHALL SLOPE WITH SIDEWALK AT CONSISTENT HEIGHT.



4 SECTION: PLANTER CURB
SCALE: N.T.S.



PLANTER CURB AT SIDEWALK



PLANTER CURB AT PAVERS

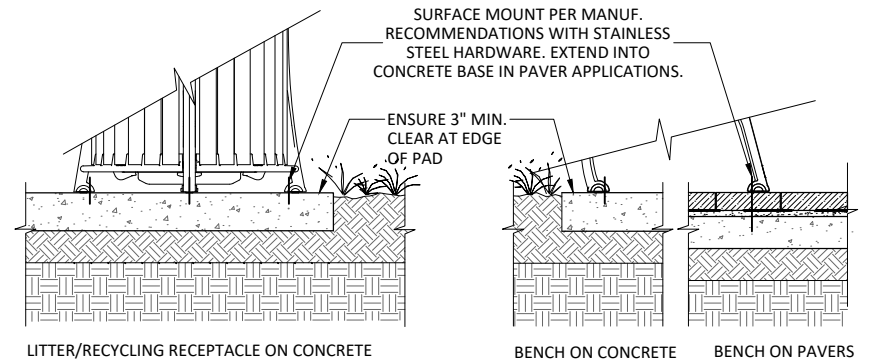
SITE FURNISHING PRODUCT NOTES:
BENCH: PARC VUE, BACKED W/ ARMS AS MANUFACTURED BY LANDSCAPE FORMS - COLOR: BLACK
CONTACT: CONNOR LOCKWOOD, 319.431.2473

BIKE RACK: GARDEN BIKE RACK, CONFIGURATION A AS MANUFACTURED BY FORMS + SURFACES - COLOR: BLACK
CONTACT: JACKIE DIETZ, 630.207.9908

LITTER RECEPTACLE: TONYO 36-GAL SPLIT STREAM, WARP PATTERN AS MANUFACTURED BY FORMS + SURFACES - COLOR: BLACK
CONTACT: JACKIE DIETZ, 630.207.9908

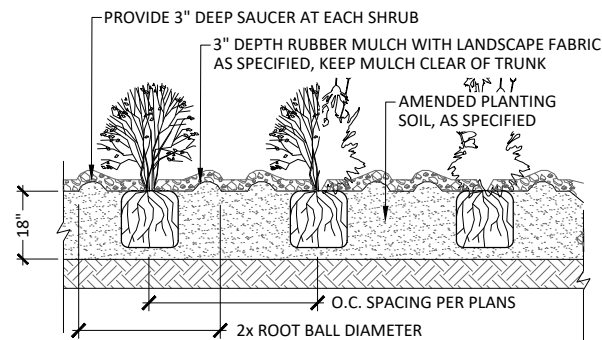
STANDING TABLE: LANDSCAPE FORMS - JESSIE RAIL W/ 12" BAR TOP, BLACK
CONTACT: CONNOR LOCKWOOD, 319.431.2473

PLANTER POT: TURNESOL - DOWNTOWN SQUARE, GFRC MATERIAL, 36" X 36" AND 42" X 42", SHARK COLOR, FINE GRAIN, PROVIDE DRAIN HOLES. SUBMIT SAMPLES FOR FINISHES AND COLORS FOR SELECTION AND APPROVAL.

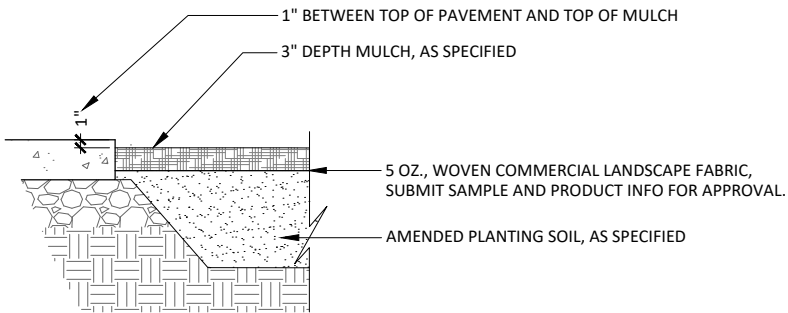


NOTES:
1. FIELD VERIFY LOCATION BY OWNER'S REPRESENTATIVE
2. SHIM TO LEVEL SITE FURNISHINGS

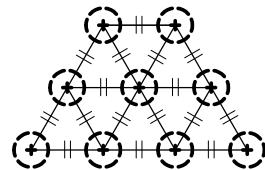
5 TYPICAL SECTION: SURFACE MOUNT FURNISHINGS
SCALE: N.T.S.



6 SHRUB/PERENNIAL BED PLANTING
SCALE: N.T.S.

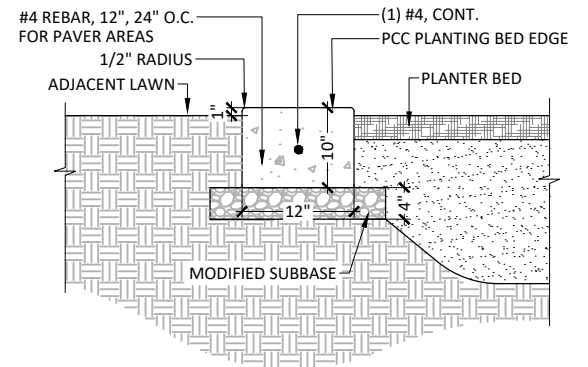


7 PLANTING BED AT PAVEMENT EDGE
SCALE: N.T.S.



NOTES:
1. O.C. TRIANGULAR PLANT SPACING PER PLANS
2. AREAS IDENTIFIED ON PLANTING PLAN AS O.C. SHALL BE TRIANGULAR SPACED
3. SEE PLANTING PLAN/SCHEDULE FOR SPECIES

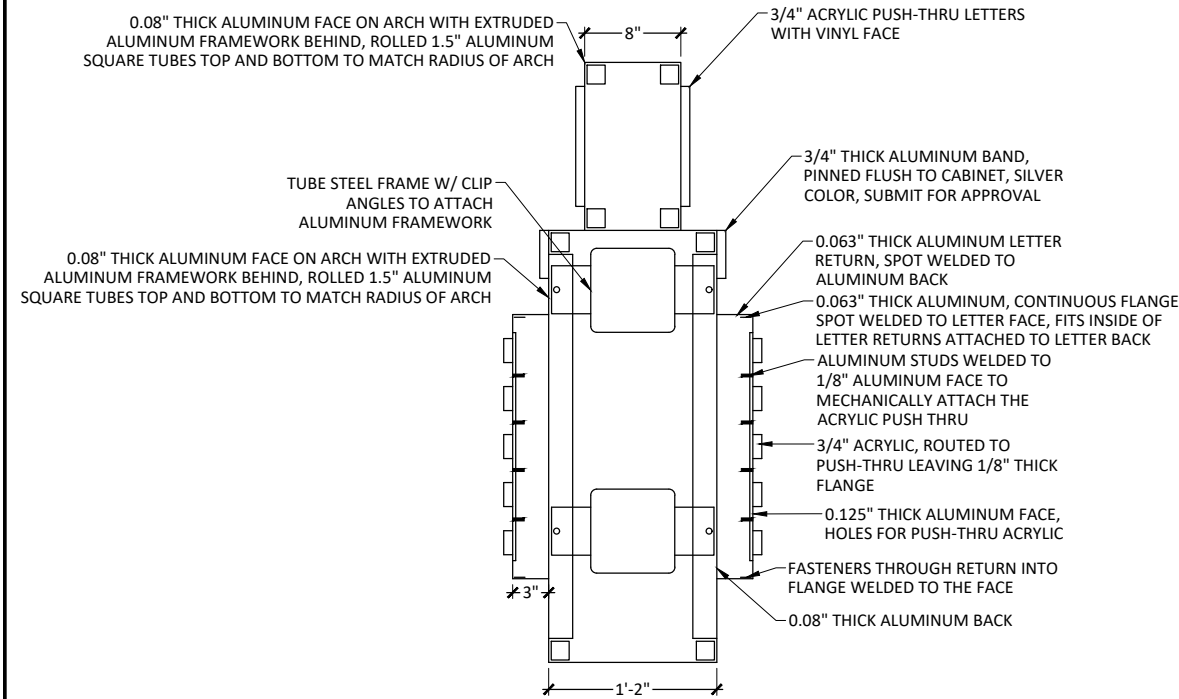
8 PERENNIAL PLANT SPACING
SCALE: N.T.S.



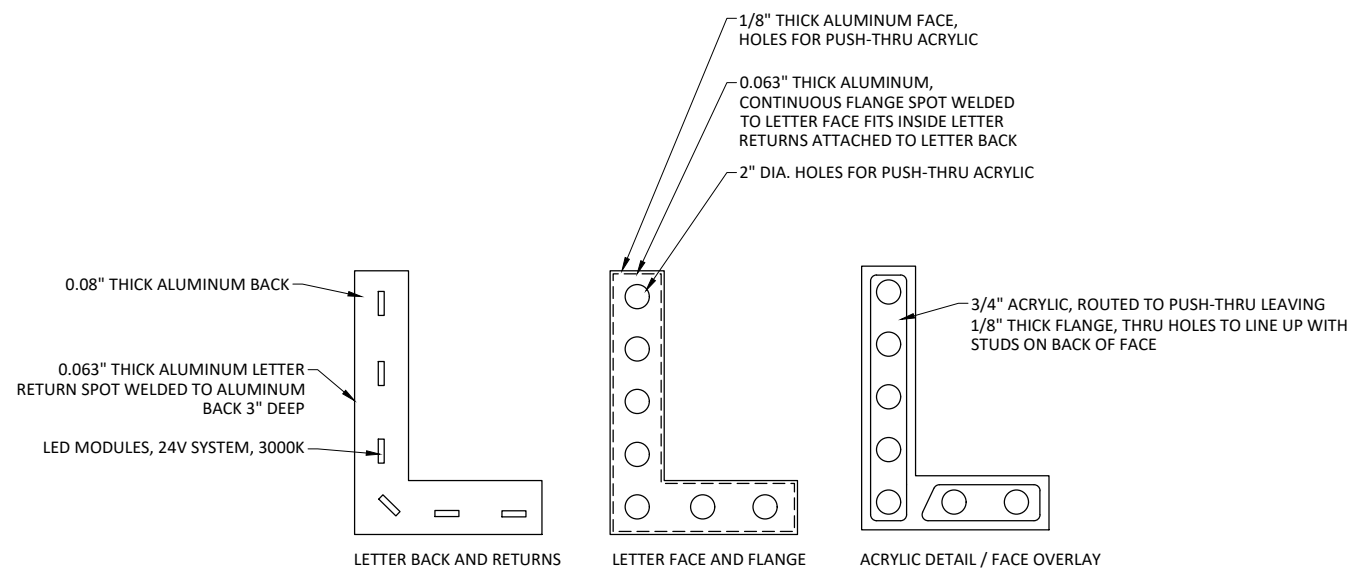
9 CONCRETE PLANTING BED EDGE
SCALE: N.T.S.

- TREE PROTECTION NOTES**
- ALL TREES TO BE PROTECTED AND PRESERVED SHALL BE PER DETAIL. GROUPING OF MORE THAN ONE TREE MAY OCCUR.
 - TREES TO BE PROTECTED AND PRESERVED SHALL BE IDENTIFIED ON THE TRUNK WITH WHITE SURVEY TAPE.
 - TO PREVENT TREE ROOT SMOTHERING, SOIL STOCKPILES, SUPPLIES, EQUIPMENT OR ANY OTHER MATERIAL SHALL NOT BE PLACED OR STORED WITHIN A TREE DRIP LINE OR WITHIN 15 FEET OF A TREE TRUNK, WHICHEVER IS GREATER.
 - TREE ROOTS SHALL NOT BE CUT UNLESS CUTTING IS UNAVOIDABLE.
 - TRENCHES SHALL BE HAND DUG WITHIN THE DRIP LINE IN AREAS WHERE ROOTS TWO INCHES IN DIAMETER AND GREATER ARE PRESENT, OR WHEN IN CLOSE PROXIMITY TO LOW BRANCHING TREES. WHENEVER POSSIBLE, ROOTS TWO INCHES OR GREATER IN DIAMETER SHALL BE TUNNELED OR BORED UNDER AND SHALL BE COVERED TO PREVENT DEHYDRATION.
 - WHEN ROOT CUTTING IS UNAVOIDABLE, A CLEAN SHARP CUT SHALL BE MADE TO AVOID SHREDDING OR SMASHING. ROOT CUTS SHOULD BE MADE BACK TO A LATERAL ROOT. WHENEVER POSSIBLE, TREE ROOTS SHOULD BE CUT BETWEEN LATE FALL AND BUD OPENING, WHEN ROOT ENERGY SUPPLIES ARE HIGH AND CONDITIONS ARE LEAST FAVORABLE FOR DISEASE CAUSING AGENTS. EXPOSED ROOTS SHALL BE COVERED IMMEDIATELY TO PREVENT DEHYDRATION. ROOTS SHALL BE COVERED WITH SOIL OR BURLAP AND KEPT MOIST.
 - WATERING OF PROTECTED TREES IN WHICH ROOTS WERE CUT SHALL BE PROVIDED BY THE CONTRACTOR.
 - AUGER TUNNELING RATHER THAN TRENCHING SHOULD BE USED FOR UTILITY PLACEMENT WITHIN DRIP LINE OF TREE.
 - FENCING MATERIAL SHALL ENCIRCLE ANY TREE WHOSE OUTER DRIP LINE EDGE IS WITHIN 20 FEET OF ANY CONSTRUCTION ACTIVITIES.
 - FENCING MATERIAL SHALL BE BRIGHT, CONTRASTING COLOR, DURABLE, AND A MINIMUM OF FOUR FEET IN HEIGHT.
 - FENCING MATERIAL SHALL BE SET AT THE DRIP LINE OR 15 FEET FROM TREE TRUNK, WHICHEVER IS GREATER, AND MAINTAINED IN AN UPRIGHT POSITION THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES.
 - ANY GRADE CHANGES (SUCH AS THE REMOVAL OF TOPSOIL OR ADDITION OF FILL MATERIAL) WITHIN THE DRIP LINE SHOULD BE AVOIDED FOR EXISTING TREES TO REMAIN. RETAINING WALLS AND TREE WELLS ARE ACCEPTABLE ONLY WHEN CONSTRUCTED PRIOR TO GRADE CHANGE.

3 EXISTING TREE PROTECTION
SCALE: N.T.S.



1 GATEWAY MONUMENT ARCH: SIGN CABINET
SCALE: N.T.S.



2 GATEWAY MONUMENT ARCH: LETTERING
SCALE: N.T.S.

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DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
CHECKED			
GAB			
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
GATEWAY MONUMENT ARCH DETAILS

SHEET
B.11

GENERAL NOTES:

1. TYPICAL STRUCTURAL DETAILS AND NOTES SHALL APPLY UNLESS NOTED OTHERWISE ON THE DRAWINGS.
2. EXAMINE SITE AND DRAWINGS TO DETERMINE LOCATIONS AND DIMENSIONS OF UTILITIES, AND SITE IMPROVEMENTS.
3. BEFORE CONSTRUCTION FABRICATION AND ERECTION OF ANY MATERIALS, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING ELEVATIONS, DIMENSIONS AND CONDITIONS AS SHOWN ON THE DRAWINGS AND REPORT DISCREPANCIES TO THE ENGINEER AT ONCE FOR RESOLUTION.
4. THE STRUCTURAL DESIGN IS BASED ONLY ON THE STRUCTURE IN ITS COMPLETED STATE. CONTRACTORS AND THEIR SUBCONTRACTORS SHALL TAKE WHATEVER PRECAUTIONS ARE NECESSARY TO WITHSTAND ALL HORIZONTAL AND VERTICAL LOADING THAT MAY BE ENCOUNTERED DURING THE CONSTRUCTION PROCESS PRIOR TO THE COMPLETION OF THE STRUCTURE.
5. WRITTEN DISTANCES & ELEVATIONS SHALL GOVERN OVER SCALED DISTANCES & ELEVATIONS.

DESIGN CRITERIA & LOADING NOTES:

1. CODE: 2018 INTERNATIONAL BUILDING CODE (IBC).
2. DESIGN LOADING
DEAD LOADS (D)

<u>MATERIALS</u>	CALCULATED
WIND LOAD (W)	
V BASIC WIND SPEED	100 MPH (3 SECOND GUST)
V _{asd} ASD WIND SPEED (V*(0.6))	86 MPH
RISK (OCCUPANCY) CATEGORY	II
EXPOSURE CATEGORY	B

MATERIAL NOTES:

<u>REINFORCED CONCRETE:</u>	
CONCRETE:	4000 PSI @ 28 DAYS
NON-SHRINK GROUT:	ASTM C1107
EUCLID NC GROUT OR APPROVED EQUAL	
REINFORCEMENT BARS:	
EPOXY COATED DEFORMED BARS	ASTM A615, GRADE 60
<u>STRUCTURAL STEEL MATERIALS:</u>	
HOLLOW STRUCTURAL SECTIONS	
TUBES	ASTM A500, GRADE B, Fy = 46 KSI
OTHER STEEL SHAPES	ASTM A36, Fy = 36 KSI
STRUCTURAL BOLTS	ASTM F3125, Grade A325
ANCHOR ROD	ASTM F1554, GRADE 36
WELD FILLER MATERIAL	70 KSI

CONCRETE NOTES:

1. LAP SPLICES AND 90 DEGREE END HOOKS SHALL BE AS SHOWN BELOW UNLESS NOTED. WHEN BARS OF TWO DIFFERENT SIZES ARE SPLICED, THE LONGER LAP LENGTH SHALL APPLY.

F'c=4,000 PSI	PIER		90 DEGREE HOOK
BAR SIZE	BAR LAP	TOP BAR	
#4	25 IN.	32 IN.	8 IN.
#5	31 IN.	40 IN.	10 IN.
#6	37 IN.	48 IN.	12 IN.
#7	54 IN.	70 IN.	14 IN.

**TOP BAR LAP SPLICES ARE HORIZONTAL REINFORCEMENT PLACED SUCH THAT MORE THAN 12 IN. OF CONCRETE IS CAST IN THE MEMBER BELOW THE SPLICE*
2. REINFORCING BARS SHALL HAVE THE FOLLOWING CONC. COVER UNLESS NOTED OTHERWISE.

FOOTINGS AND OTHER UNFORMED SURFACES	3"
CONCRETE EXPOSED TO EARTH, WEATHER OR FLUIDS	
#6 BARS OR LARGER	2"
#5 BARS OR SMALLER	1-1/2"
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	
BEAMS, COLUMNS, TIES, SPIRALS AND STIRRUPS	1-1/2"
SLABS, WALLS & JOISTS	3/4"
3. CONCRETE SHALL BE PLACED WITHOUT CONSTRUCTION JOINTS EXCEPT WHERE SPECIFICALLY SHOWN ON THE DRAWINGS OR AS APPROVED BY THE ENGINEER.
4. CAST-IN-PLACE CONCRETE SHALL NOT BE PLACED IN STANDING WATER, ON FROZEN SOIL OR ON FROZEN CONCRETE.
5. FOR LOCATIONS AND DIMENSIONS OF SLEEVES, CURB, OPENINGS AND DEPRESSIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS, SEE ARCHITECTURAL, CIVIL/MECHANICAL, AND ELECTRICAL DRAWINGS. CONTRACTOR SHALL VERIFY AND COORDINATE REQUIREMENTS FOR AND LOCATION OF ABOVE ITEMS WHETHER SHOWN ON THE STRUCTURAL DRAWINGS OR NOT.

STEEL NOTES:

1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE LATEST AISC SPECIFICATION PARTS 1 THRU 4 AND THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".
2. ALL WELDING SHALL BE DONE BY AWS CERTIFIED WELDERS. ALL WELDING SHALL BE PERFORMED WITH FILLER METAL HAVING A MINIMUM TENSILE STRENGTH OF 70 KSI. WELDING SHALL CONFORM TO THE PROVISIONS OF THE LATEST STRUCTURAL WELDING CODE (AWS D1.1).
3. ALL WELDING SHALL BE BY WELDERS HOLDING CURRENT VALID CERTIFICATES IN THE TYPE OF WELDING REQUIRED.
4. REPAIR ALL DAMAGED GALVANIZED SURFACES IN ACCORDANCE WITH ASTM A780.
5. ANCHOR BOLTS EMBEDDED IN CONCRETE SHALL BE ACCURATELY POSITIONED WITH A TEMPLATE AND SECURED TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT OPERATIONS.
6. ALL STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123.
7. STRUCTURAL STEEL SUPPLIER SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
8. STRUCTURAL STEEL DESIGN AND CONSTRUCTION SHALL CONFORM TO AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN" AND AISC "CODE OF STANDARD PRACTICE" LATEST EDITIONS.
9. SLOTTED HOLES INDICATED IN THE DRAWINGS ARE INTENDED TO ALLOW MOVEMENT AND SHOULD BE INSTALLED AS INDICATED. WHERE SLOTTED HOLES WERE NOT DETAILED, BUT CHOSEN BY THE FABRICATOR FOR ERECTION TOLERANCE OR OTHERWISE. ASTM A325-SC BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".

EXCAVATION NOTES:

1. TEMPORARY GROUND CONTROL IS BY CONTRACTOR DESIGN.
2. CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TEMPORARY SHEETING AND BRACING NECESSARY TO PROTECT PERSONNEL AND ADJACENT PROPERTY FROM INJURY OR DAMAGE DURING CONSTRUCTION OPERATION.
3. EXCAVATIONS OR TRENCHING WITHIN CLOSE PROXIMITY TO UNDERGROUND STRUCTURES, UTILITIES, OR UTILITY POLES WILL REQUIRE PROTECTION AND SUPPORT TO PREVENT DAMAGE OR INTERRUPTION TO SERVICE. THE COST TO PROVIDE THIS PROTECTION SHALL BE INCLUDED IN THE CONTRACTOR'S TOTAL BASE BID PRICE.

FOUNDATION & SOIL NOTES:

1. THE GEOTECHNICAL ENGINEER SHALL REVIEW AND APPROVE FOUNDATION BEARING SURFACES PRIOR TO THE PLACEMENT OF FOOTINGS OR FOUNDATION.
2. PROVIDE A MINIMUM OF 5'-0" OF SOIL COVER AT ALL UNHEATED STRUCTURE FOOTINGS.
3. PROTECT FOUNDATION SOILS FROM FREEZING DURING CONSTRUCTION.
4. PLACE FILL AND BACKFILL AND COMPACT TO FOLLOWING MAXIMUM STANDARD PROCTOR DENSITIES UNLESS NOTED OTHERWISE IN THE SPECIFICATIONS:

<u>LOCATION</u>	<u>DENSITY</u>
FILL BELOW FOOTINGS	100%
5. FOUNDATION DESIGN IS BASED ON REQUIREMENTS OF GEOTECHNICAL EVALUATION
REPORT NO. 222087MSM
DATED: 12/21/2022
PREPARED BY: CONSTRUCTION MATERIALS TESTING
6. ASSUMED ALLOWABLE SOIL BEARING PRESSURE: 1,500 PSF



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DESIGNED	GGB	REV.		DESCRIPTION	DATE
DRAWN	GGB				
CHECKED	GGB				
CLIENT PROJ. NO	0A1.129221				

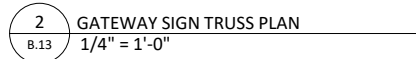
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STRUCTURAL GENERAL NOTES
GATEWAY SIGN

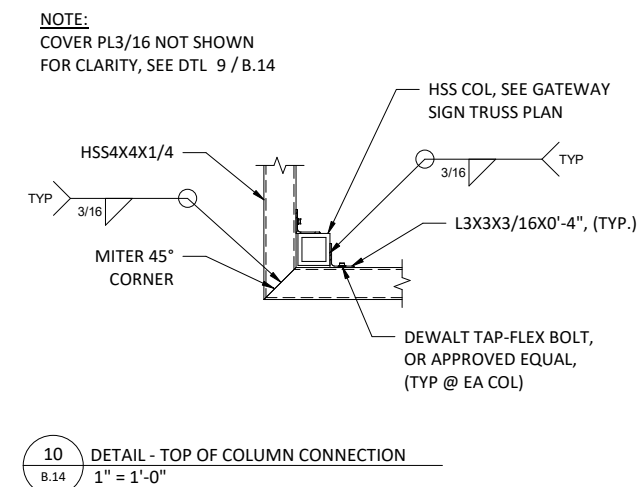
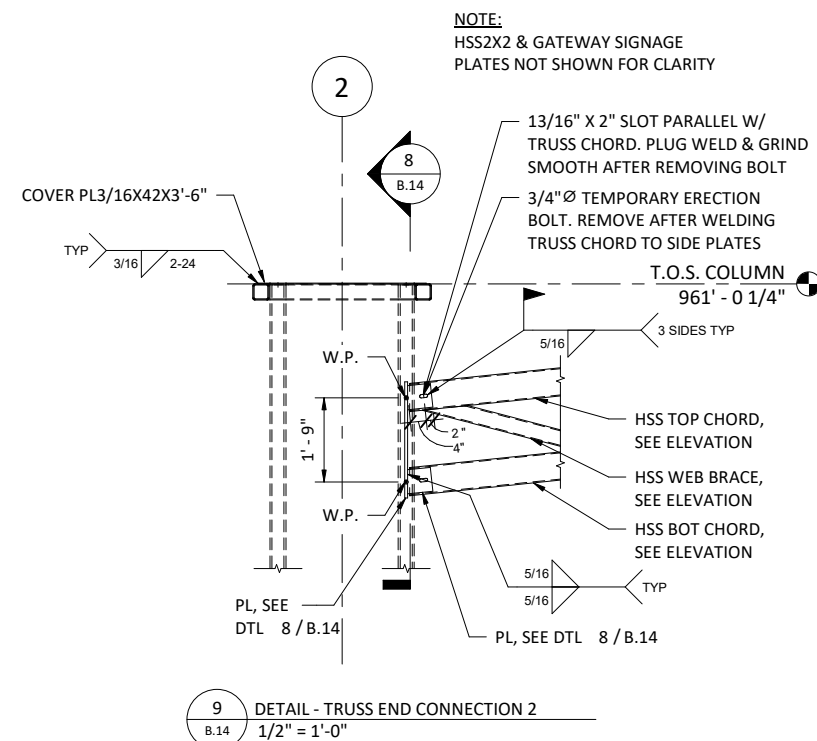
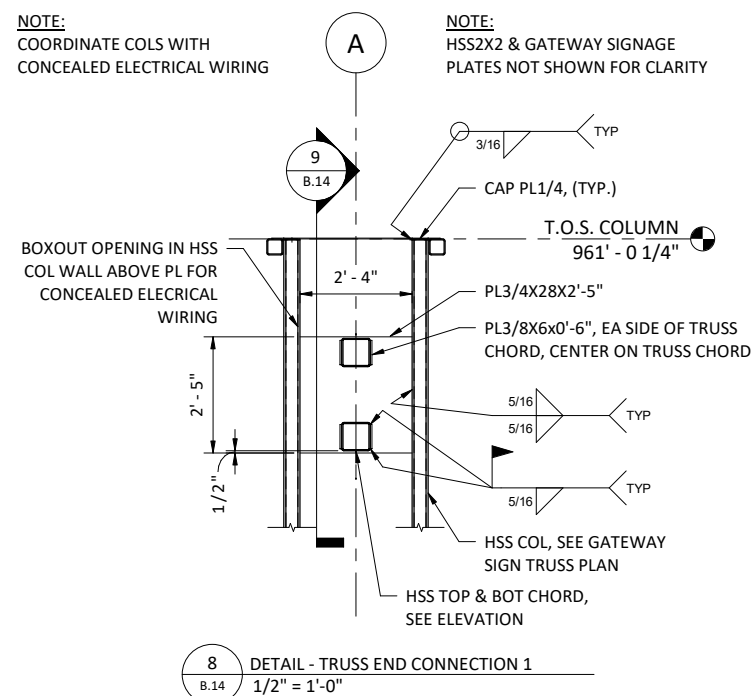
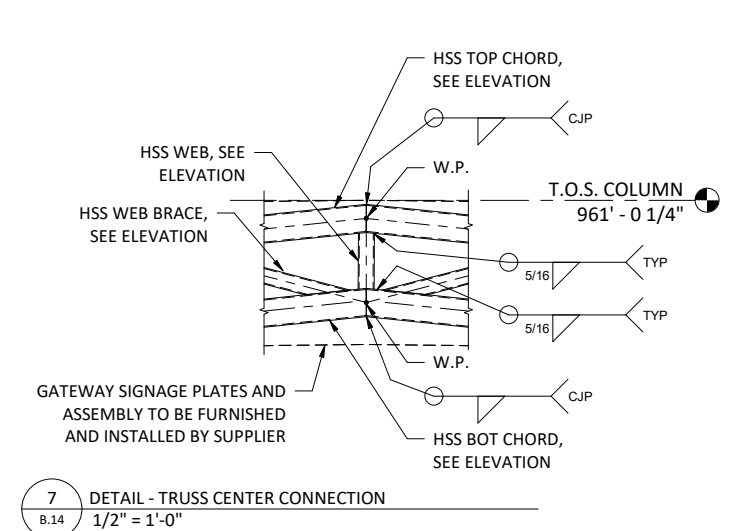
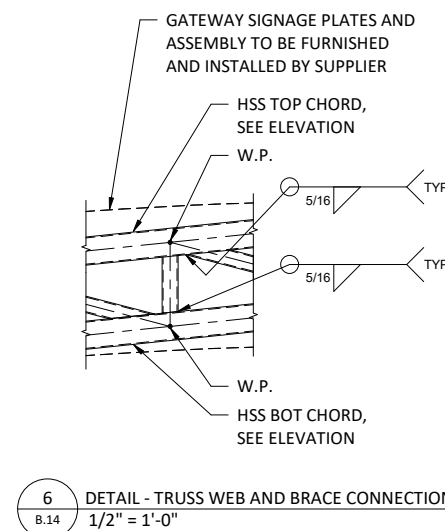
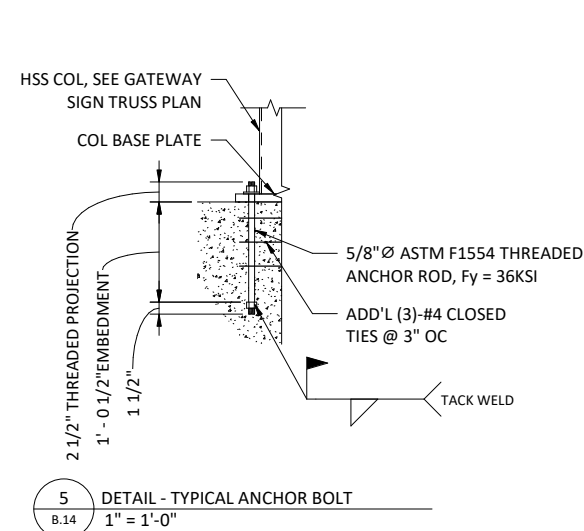
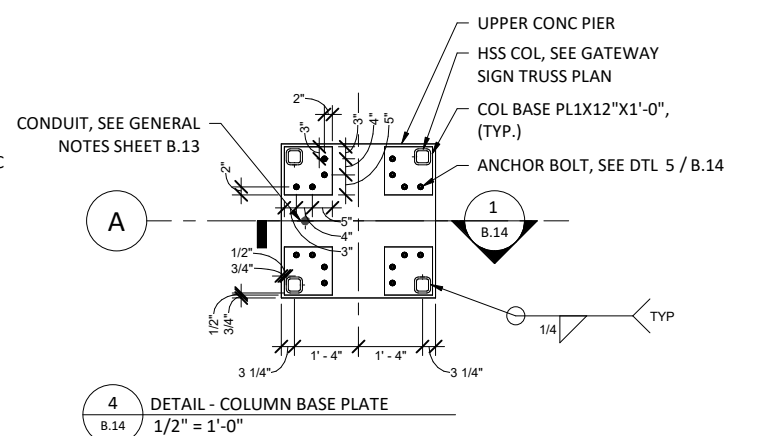
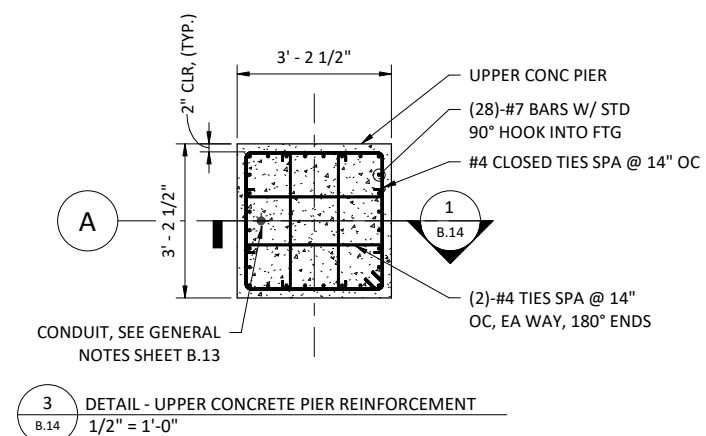
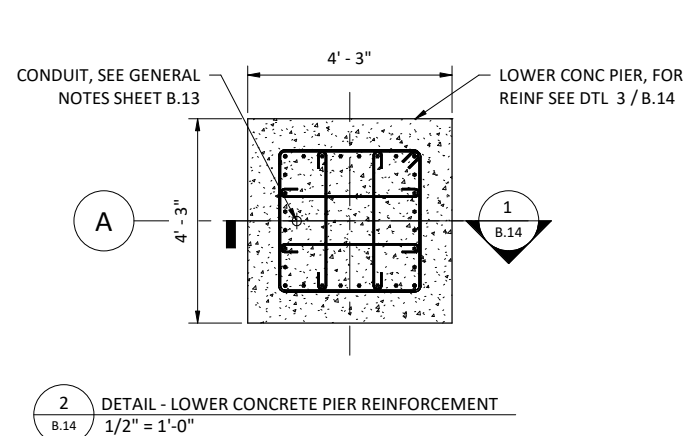
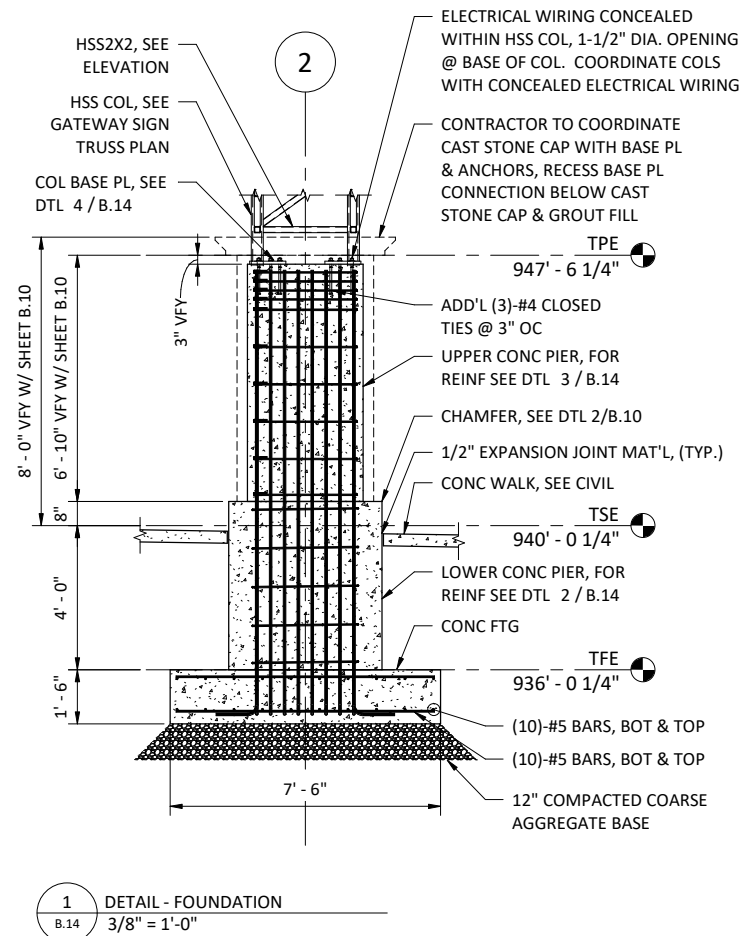
SHEET

B.12

1. SCALES SHOWN ARE BASED ON FULL SIZE (22X34) DRAWINGS. REDUCE SCALES BY 2 FOR 11X17 DRAWINGS.
2. FOR GENERAL STRUCTURAL NOTES, SEE SHEET B.12.
3. V.I.F. INDICATES FOR CONTRACTOR TO VERIFY IN FIELD.
4. TFE INDICATES TOP OF FOOTING ELEVATION.
5. TSE INDICATES TOP OF SLAB ELEVATION.
6. TPE INDICATES TOP OF PIER ELEVATION.
7. U.N.O. INDICATES UNLESS NOTED OTHERWISE.
8. W.P. INDICATES WORKING POINT.
9. VERIFY ELEVATIONS WITH CIVIL DRAWINGS.
10. GATEWAY SIGN TO BE COORDINATED WITH DETAILS ON SHEET B.10.
11. VENEER AND CAST STONE TO BE COORDINATED WITH DETAILS ON SHEET B.10.
12. COORDINATE CONDUIT SIZE & LOCATION WITHIN THE CONCRETE PIERS W/ ELECTRICAL SHEET P.06. CONDUIT LOCATION NOT PERMITTED WITHIN THE HSS COLUMN BASE PLATE EXTENTS

1. SPREAD FOOTINGS ARE CENTERED ON CONCRETE PIERS.
2. CONCRETE PIERS ARE CENTERED ON STEEL COLUMNS.





NOTE:
COORDINATE COLS WITH
CONCEALED ELECTRICAL WIRING

NOTE:
HSS2X2 & GATEWAY SIGNAGE
PLATES NOT SHOWN FOR CLARITY

NOTE:
HSS2X2 & GATEWAY SIGNAGE
PLATES NOT SHOWN FOR CLARITY

NOTE:
COVER PL3/16 NOT SHOWN
FOR CLARITY, SEE DTL 9 / B.14

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ESTIMATED PROJECT QUANTITIES - BASE BID									
ITEM NO.	ITEM CODE	ITEM	UNIT	DIV 1 - CITY	AS-BUILT QTY.	DIV 2 - WATER WORKS	AS-BUILT QTY.	TOTAL EST. QUANTITY	AS-BUILT QTY.
1	0000-999-A	VAULT - DEMO VAULT TOP	SY	253		0		253	
2	0000-999-B	VAULT - DEMO STAIRS	SF	32		0		32	
3	0000-999-C	VAULT - INFILL OPENING, SINGLE WYTHE, 10 INCH	SF	17		0		17	
4	0000-999-D	VAULT - INFILL OPENING, SINGLE WYTHE, 12 INCH	SF	102		0		102	
5	0000-999-E	VAULT - INFILL OPENING, DOUBLE WYTHE, 24 INCH	SF	44		0		44	
6	0000-999-F	VAULT - WALL OPENING INFILL, 12" CMU	SF	66		0		66	
7	0000-999-G	VAULT - WALL OPENING INFILL, CONCRETE	CF	30		0		30	
8	0000-999-H	VAULT - CMU BLOCK WALL, 12 INCH	SF	143		0		143	
9	0000-999-I	VAULT - CAST IN PLACE WALL AND DOOR INFILL	CY	4.6		0		4.6	
10	0000-999-J	VAULT - WALL FOOTING UNDER NEW WALL	CY	7.4		0		7.4	
11	0000-999-K	VAULT - WATERPROOF WALL	SF	1255		0		1255	
12	0000-999-L	VAULT - DRILLING HOLES IN CONCRETE FLOOR	EA	59		0		59	
13	0000-999-M	VAULT - GRANULAR FILL	CY	486		0		486	
14	0000-999-N	VAULT - STAIR REPLACEMENT	EA	2		0		2	
15	0000-999-O	VAULT - STRUCTURAL SIDEWALK	SY	5.6		0		5.6	
16	0000-999-P	COLLAPSIBLE BOLLARD	EA	4		0		4	
17	0000-999-P	BOLLARD	EA	1		0		1	
18	0000-999-Q	GATEWAY MONUMENT ARCH	LS	1		0		1	
19	0000-999-R	BENCH (FURNISH AND INSTALL)	EA	3		0		3	
20	0000-999-R	BENCH (INSTALL ONLY)	EA	3		0		3	
21	0000-999-S	LITTER RECEPTACLE (INSTALL ONLY)	EA	9		0		9	
22	0000-999-T	BIKE RACK (INSTALL ONLY)	EA	3		0		3	
23	0000-999-U	FLAG POLE	EA	2		0		2	
24	0000-999-V	PLANTER POT, 36" X 36"	EA	10		0		10	
25	0000-999-V	PLANTER POT, 42" X 42"	EA	10		0		10	
26	0000-999-W	STANDING HEIGHT TABLE	EA	5		0		5	
27	0000-999-X	CAST STONE SEATWALL TYPE 'A'	LF	60		0		60	
28	0000-999-Y	CAST STONE SEATWALL TYPE 'B'	LF	152		0		152	
29	0000-999-Z	ELECTRICAL WIRING, CONDUIT, AND DISTRIBUTION PEDESTALS	LS	1		0		1	
30	0000-999-AA	HANDHOLE (HH-1 AND HH-2)	EA	13		0		13	
31	0000-999-AB	HANDHOLE (HH-3)	EA	1		0		1	
32	0000-999-AB	TYPE S1, S1A, S1B LIGHT POLE ASSEMBLY	EA	25		0		25	
33	0000-999-AC	TYPE S2A, S2B, S2C, S2D LIGHT POLE ASSEMBLY	EA	8		0		8	
34	0000-999-AD	TYPE S2 LIGHT POLE ASSEMBLY	EA	16		0		16	
35	0000-999-AE	TYPE S3 LIGHT POLE ASSEMBLY	EA	8		0		8	
36	0000-999-AE	TYPE S3C, S3D LIGHT POLE ASSEMBLY	EA	2		0		2	
37	0000-999-AE	TYPE S4 LIGHT POLE ASSEMBLY	EA	2		0		2	
38	0000-999-AF	TYPE S3F CATENARY LIGHTING ASSEMBLY	LS	1		0		1	
39	0000-999-AG	LIGHT POLE FOUNDATION	EA	61		0		61	
40	0000-999-AH	EVENT POWER PEDESTAL (PED-1)	EA	2		0		2	
41	0000-999-AI	TREE PROTECTION	EA	6		0		6	
42	0000-999-AJ	REMOVE AND REINSTALL LINCOLN HIGHWAY MARKER	EA	1		0		1	
43	0000-999-AK	CONCRETE PLANTING BED EDGE	LF	75		0		75	
44	2010-C	CLEARING AND GRUBBING	LS	1		0		1	
45	2010-D-2	AMENDED PLANTING SOIL	CY	277		0		277	
46	2010-D-3	TOPSOIL, OFF-SITE, 8 INCH	CY	375		0		375	
47	2010-D-4	STRUCTURAL SOIL (TREE PLANTING)	CY	722		0		722	
48	2010-E	EXCAVATION, CLASS 13	CY	5350		0		5350	
49	2010-G	SUBGRADE PREPARATION, 12 INCH	SY	13345		0		13345	
50	2010-H	GRANULAR STABILIZATION	TON	1220		0		1220	
51	2010-I	SUBGRADE TREATMENT, MULTIAXIAL GEO-GRID	SY	13345		0		13345	
52	2010-J	SUBBASE, MODIFIED, 4 INCHES	SY	8063		0		8063	
53	2010-J	SUBBASE, MODIFIED, 6 INCHES	SY	253		0		253	
54	2010-J	SUBBASE, MODIFIED, 8 INCHES	SY	13345		0		13345	
55	2010-K-1-A	REMOVAL OF STRUCTURE, ELECTRICAL METER	EA	2		0		2	
56	2010-K-1-A	REMOVAL OF STRUCTURE, LIGHT POLE FOOTING	EA	34		0		34	
57	2010-K-1-A	REMOVAL OF STRUCTURE, HANDHOLE	EA	0		0		0	
58	2010-K-1-A	REMOVAL OF STRUCTURE, FLAG POLE	EA	2		0		2	
59	2010-K-1-A	REMOVAL OF STRUCTURE, MISC. SITE FURNISHINGS	LS	1		0		1	
60	2010-K-1-B	TROLLEY TRACK REMOVAL	LF	1400		0		1400	
61	2010-M	COMPACTION TESTING	LS	1		0		1	
62	2010-999-A	EXPLORATORY EXCAVATION	HR	40		0		40	
63	3010-C	TRENCH FOUNDATION	TON	200		0		200	
64	3010-D	REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL	CY	400		0		400	



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DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
DEM			
CHECKED			
GAB			
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

QUANTITIES

SHEET

C.01

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ESTIMATED PROJECT QUANTITIES - BASE BID									
ITEM NO.	ITEM CODE	ITEM	UNIT	DIV 1 - CITY	AS-BUILT QTY.	DIV 2 - WATER WORKS	AS-BUILT QTY.	TOTAL EST. QUANTITY	AS-BUILT QTY.
65	3010-F	TRENCH COMPACTION TESTING	LS	1		0		1	
66	3010-999-A	DISPOSAL OF CONTAMINATED SOIL	TON	991		0		991	
67	3010-999-A	DISPOSAL OF CONTAMINATED GROUND WATER	GAL	500		0		500	
68	4020-A-1	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1		0		1	
69	4020-A-1	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1		0		1	
70	4020-A-1	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1		0		1	
71	4020-A-1	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1		0		1	
72	4020-A-1	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1		0		1	
73	4020-A-1	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1		0		1	
74	4020-A-1	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1		0		1	
75	4020-A-1	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1		0		1	
76	4020-A-1	STORM SEWER, TRENCHED, PVC, 10 INCH	LF	92		0		92	
77	4020-A-1	STORM SEWER, TRENCHED, PVC, 12 INCH	LF	150		0		150	
78	4020-A-1	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	1341		0		1341	
79	4020-A-1	STORM SEWER, TRENCHED, RCP, 24 INCH	LF	444		0		444	
80	4020-A-1	STORM SEWER, TRENCHED, RCP, 36 INCH	LF	502		0		502	
81	4020-D	REMOVAL OF STORM SEWER, 36 INCH OR LESS	LF	1047		0		1047	
82	4040-A	SUBDRAIN, TYPE 1C, PVC, 6 INCH	LF	1984		0		1984	
83	4040-C-1	SUBDRAIN CLEANOUT, TYPE A-1, 6 INCH	EA	2		0		2	
84	4040-D-1	SUBDRAIN OUTLETS AND CONNECTIONS	EA	30		0		30	
85	5010-A-1	WATER MAIN, TRENCHED, DIP WITH NITRILE GASKETS, 8 INCH	LF	0		2553		2553	
86	5010-C-1	FITTING, DUCTILE IRON	LB.	0		3983		3983	
87	5010-E-1	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, SHORT SIDE	EA	0		1		1	
88	5010-E-1	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, LONG SIDE	EA	0		2		2	
89	5010-E-1	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	0		5		5	
90	5010-E-1	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, LONG SIDE	EA	0		4		4	
91	5010-E-1	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	5		0		5	
92	5010-E-1	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, SHORT SIDE	EA	2		0		2	
93	5010-E-1	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, LONG SIDE	EA	2		0		2	
94	5010-E-1	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	6		0		6	
95	5010-E-1	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, LONG SIDE	EA	3		0		3	
96	5010-E-1	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, SHORT SIDE	EA	4		0		4	
97	5010-E-1	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, LONG SIDE	EA	1		0		1	
98	5010-E-1	WATER SERVICE PIPE, COPPER, 3/4 INCH, SHORT SIDE	EA	0		7		7	
99	5010-E-1	WATER SERVICE PIPE, COPPER, 3/4 INCH, LONG SIDE	EA	0		5		5	
100	5010-E-1	WATER SERVICE PIPE, COPPER, 1 INCH, SHORT SIDE	EA	0		9		9	
101	5010-E-1	WATER SERVICE PIPE, COPPER, 1 INCH, LONG SIDE	EA	0		3		3	
102	5010-E-1	WATER SERVICE PIPE, COPPER, 1 1/4 INCH, SHORT SIDE	EA	0		3		3	
103	5010-E-1	WATER SERVICE PIPE, COPPER, 1 1/4 INCH, LONG SIDE	EA	0		1		1	
104	5010-E-1	WATER SERVICE PIPE, COPPER, 1 1/2 INCH, SHORT SIDE	EA	0		1		1	
105	5010-E-1	WATER SERVICE PIPE, COPPER, 1 1/2 INCH, LONG SIDE	EA	0		1		1	
106	5010-E-1	WATER SERVICE PIPE, COPPER, 1 3/4 INCH, SHORT SIDE	EA	0		1		1	
107	5010-E-1	WATER SERVICE PIPE, COPPER, 1 3/4 INCH, LONG SIDE	EA	0		2		2	
108	5010-E-1	WATER SERVICE PIPE, COPPER, 2 INCH, SHORT SIDE	EA	0		3		3	
109	5010-E-1	WATER SERVICE PIPE, COPPER, 2 INCH, LONG SIDE	EA	0		1		1	
110	5010-E-1	WATER SERVICE PIPE, COPPER, 2 1/2 INCH, SHORT SIDE	EA	0		1		1	
111	5010-E-1	WATER SERVICE PIPE, COPPER, 2 1/2 INCH, LONG SIDE	EA	0		1		1	
112	5010-E-3	WATER SERVICE CURB STOP AND BOX	EA	0		38		38	
113	5010-H	WATER MAIN REMOVAL	LF	0		2388		2388	
114	5020-A	VALVE, GATE, 4 INCH, FIRE SERVICE	EA	0		2		2	
115	5020-A	VALVE, GATE, 6 INCH, FIRE SERVICE	EA	0		30		30	
116	5020-A	VALVE, GATE, 8 INCH	EA	0		12		12	
117	5020-A	INSERTION VALVE, 6 INCH	EA	0		2		2	
118	5020-A	INSERTION VALVE, 8 INCH	EA	0		2		2	
119	5020-A	LINE STOP, 8 INCH	EA	0		4		4	
120	5020-A	LINE STOP, 10 INCH	EA	0		1		1	
121	5020-C	FIRE HYDRANT ASSEMBLY	EA	0		8		8	
122	5020-E	FLUSHING DEVICE (TEMPORARY BLOWOFF DEVICE)	EA	0		12		12	
123	5020-J	FIRE HYDRANT ASSEMBLY REMOVAL	EA	0		4		4	
124	5020-K	VALVE REMOVAL	EA	0		22		22	
125	6010-A	STORM MANHOLE, SW-401, 48 INCH	EA	1		0		1	
126	6010-A	STORM MANHOLE, SW-401, 84 INCH	EA	1		0		1	
127	6010-B	INTAKE, SW-501	EA	6		0		6	
128	6010-B	INTAKE, SW-503	EA	1		0		1	



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DESIGNED	REV	DESCRIPTION	DATE
	A	90% PROGRESS PLANS	12/20/2024
DRAWN	DEM		
CHECKED	GAB		
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

QUANTITIES

SHEET

C.02

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ESTIMATED PROJECT QUANTITIES - BASE BID									
ITEM NO.	ITEM CODE	ITEM	UNIT	DIV 1 - CITY	AS-BUILT QTY.	DIV 2 - WATER WORKS	AS-BUILT QTY.	TOTAL EST. QUANTITY	AS-BUILT QTY.
129	6010-B	INTAKE, SW-505	EA	14		0		14	
130	6010-B	INTAKE, SW-506	EA	4		0		4	
131	6010-B	INTAKE, SW-507	EA	3		0		3	
132	6010-B	INTAKE, SW-541, MODIFIED	EA	3		0		3	
133	6010-F	MANHOLE ADJUSTMENT, MINOR	EA	1		0		1	
134	6010-G	CONNECTION TO EXISTING MANHOLE	EA	0		0		0	
135	6010-H	REMOVE MANHOLE	EA	8		0		8	
136	6010-H	REMOVE INTAKE	EA	16		0		16	
137	7010-A	PAVEMENT, PCC, 8 INCH, C4WRC20	SY	11778		0		11778	
138	7010-F	PLANTER CURB	LF	2433		0		2433	
139	7010-I	PCC PAVEMENT SAMPLES AND TESTING	LS	1		0		1	
140	7030-A-1	REMOVAL OF SIDEWALK	SY	6738		0		6738	
141	7030-A-3	REMOVAL OF DRIVEWAY	SY	405		0		405	
142	7030-E	SIDEWALK, PCC, 5 INCH	SY	5463		0		5463	
143	7030-E	SIDEWALK, PCC, 6 INCH	SY	494		0		494	
144	7030-F	CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE	SF	3001		0		3001	
145	7030-F	ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE	SF	2294		0		2294	
146	7030-F	SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE	SF	12679		0		12679	
147	7030-G	DETECTABLE WARNING	SF	453		0		453	
148	7030-H-1	DRIVEWAY, PAVED, PCC, 7 INCH	SY	152		0		152	
149	7030-H-1	DRIVEWAY, PAVED, PCC, 8 INCH (ALLEY)	SY	168		0		168	
150	7030-I-1	SIDEWALK ASSURANCE TESTING	LS	1		0		1	
151	7030-I-3	DRIVEWAY ASSURANCE TESTING	LS	1		0		1	
152	7040-H	PAVEMENT REMOVAL	SY	12700		0		12700	
153	8020-B	PAINTED PAVEMENT MARKINGS, SOLVENT/WATERBORNE	STA	150		0		150	
154	8020-G	PAINTED SYMBOLS AND LEGENDS	EA	8		0		8	
155	8030-A	TEMPORARY TRAFFIC CONTROL	LS	1		0		1	
156	8030-A	TEMPORARY TRAFFIC CONTROL - PEDESTRIAN ACCESS	LS	1		0		1	
157	8040-J	REMOVE AND SALVAGE TRAFFIC SIGN ASSEMBLY	EA	42		0		42	
158	9020-A	SOD	SQ	139		0		139	
159	9030-B	PLANTS WITH WARRANTY, DECIDUOUS SHRUB, (#5 CONT)	EA	21		0		21	
160	9030-B	PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL)	EA	2516		0		2516	
161	9030-B	PLANTS WITH WARRANTY, DECIDUOUS TREE	EA	54		0		54	
162	9030-999-A	RUBBER MULCH	CY	46		0		46	
163	9030-999-B	IRRIGATION SYSTEM	LS	1		0		1	
164	9040-A-1	SWPPP PREPARATION	LS	1		0		1	
165	9040-A-2	SWPPP MANAGEMENT	LS	1		0		1	
166	9040-F-1	WATTLE, STRAW, 9 INCH	LF	2800		0		2800	
167	9040-O-1	STABILIZED CONSTRUCTION ENTRANCE	EA	1		0		1	
168	9040-T-1	INLET PROTECTION DEVICE	EA	58		0		58	
169	11010-A	CONSTRUCTION SURVEY	LS	1		0		1	
170	11010-B	MONUMENT PRESERVATION AND REPLACEMENT	LS	1		0		1	
171	11020-A	MOBILIZATION	LS	1		0		1	
172	11030-A	MAINTENANCE OF POSTAL SERVICE	LS	1		0		1	
173	11040-B	TEMPORARY GRANULAR SIDEWALK	SY	400		0		400	
174	11040-C	TEMPORARY LONGITUDINAL CHANNELIZING DEVICE	LF	4430		0		4430	
175	11050-A	CONCRETE WASHOUT	LS	1		0		1	



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
QUANTITIES

SHEET

C.03

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ESTIMATE REFERENCE INFORMATION		
ITEM NO.	ITEM CODE	DESCRIPTION
1	0000-999-A	<u>VAULT - DEMO VAULT TOP</u> A. INCLUDES REMOVAL OF EXISTING SIDEWALK OVER CAVITY AND CAVITY WALLS. B. INCLUDES REMOVAL OF AT LEAST TOP 2' OF EXISTING VAULT WALLS, REMOVAL OF ALL DEBRIS, WOOD PRODUCTS AND OTHER PRODUCTS THAT WILL DECOMPOSE IN THE CAVITY. C. ANY REPAIR TO EXISTING BUILDING FACE DUE TO VAULT REMOVAL OR REPAIR TO EXPOSED AREAS SHALL BE INCIDENTAL TO THIS ITEM. D. REFER TO V SHEETS FOR DETAILS.
2	0000-999-B	<u>VAULT - DEMO STAIRS</u> A. INCLUDES REMOVAL OF AT LEAST TOP 2 STAIRS OF EXISTING STAIRCASE LOCATED AT 4 E. MAIN STREET. B. REFER TO V SHEETS FOR DETAILS.
3	0000-999-C	<u>VAULT - INFILL OPENING, SINGLE WYTHE, 10 INCH</u> A. REFER TO V SHEETS FOR DETAILS.
4	0000-999-D	<u>VAULT - INFILL OPENING, SINGLE WYTHE, 12 INCH</u> A. REFER TO V SHEETS FOR DETAILS.
5	0000-999-E	<u>VAULT - INFILL OPENING, DOUBLE WYTHE, 24 INCH</u> A. REFER TO V SHEETS FOR DETAILS.
6	0000-999-F	<u>VAULT - WALL OPENING INFILL, 12" CMU</u> A. REFER TO V SHEETS FOR DETAILS.
7	0000-999-G	<u>VAULT - WALL OPENING INFILL, CONCRETE</u> A. REFER TO V SHEETS FOR DETAILS.
8	0000-999-H	<u>VAULT - CMU BLOCK WALL, 12 INCH</u> A. REFER TO V SHEETS FOR DETAILS.
9	0000-999-I	<u>VAULT - CAST IN PLACE WALL AND DOOR INFILL</u> A. REFER TO V SHEETS FOR DETAILS.
10	0000-999-J	<u>VAULT - WALL FOOTING UNDER NEW WALL</u> A. REFER TO V SHEETS FOR DETAILS.
11	0000-999-K	<u>VAULT - WATERPROOF WALL</u> A. WATERPROOFING FOR THE VAULT WALL INCLUDING REMOVAL OF ALL LOOSE CONCRETE AND MORTAR, APPLICATION OF CEMENTITIOUS VERTICAL MORTAR COAST, APPLICATION OF WATERPROOF MEMBRANE AND INSTALLATION OF 2 INCH EXTRUDED POLYSTYRENE RIGID INSULATION. B. REFER TO V SHEETS FOR DETAILS AND SPECIFICATIONS.
12	0000-999-L	<u>VAULT - DRILLING HOLES IN CONCRETE FLOOR</u> A. REFER TO V SHEETS FOR DETAILS.
13	0000-999-M	<u>VAULT - GRANULAR FILL</u> A. REFER TO V SHEETS FOR DETAILS.
14	0000-999-N	<u>VAULT - STAIR REPLACEMENT</u> A. REFER TO V SHEETS FOR DETAILS. B. CONTRACTOR SHALL REBUILD 2 EXISTING CONCRETE STAIRS AT 19 S. CENTER THAT WILL BE REMOVED AS PART OF THE VAULT REPAIR PROCESS. THE STAIRS ARE PART OF THE PRIMARY BUILDING ENTRANCE. PROPOSED STAIRS SHALL MATCH EXISTING STAIRS FOR HEIGHT AND TREAD LENGTH.
15	0000-999-O	<u>VAULT - STRUCTURAL SIDEWALK</u> A. REFER TO V SHEETS FOR DETAILS.
16	0000-999-P	<u>COLLAPSIBLE BOLLARD</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL COLLAPSIBLE BOLLARD. SEE D SHEETS FOR LOCATION AND B SHEETS FOR DETAILS. B. ITEM IS TO BE PAID PER EACH INSTALLED COLLAPSIBLE BOLLARD.
17	0000-999-P	<u>BOLLARD</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL NON-REMOVABLE BOLLARD. SEE D SHEETS FOR LOCATION AND B SHEETS FOR DETAILS. B. ITEM IS TO BE PAID PER EACH.
18	0000-999-Q	<u>GATEWAY MONUMENT ARCH</u> A. INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL GATEWAY MONUMENT ARCH. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. ITEM IS TO BE PAID ON A LUMP SUM BASIS. C. ITEM SHALL INCLUDE ALL ITEMS NECESSARY FOR COMPLETE INSTALLATION OF MONUMENT; INCLUDING BUT NOT LIMITED TO THE FOLLOWING: EXCAVATION FOR FOOTINGS, REMOVAL AND DISPOSAL OF EXCAVATED MATERIAL, REINFORCED CONCRETE FOOTING, REINFORCED CONCRETE CORE, ALL CAST STONE VENEER AND CAPS, ACRYLIC PANELS, ALL REQUIRED ELECTRICAL COMPONENTS INCLUDING: WIRING, DRIVERS, LED LIGHTING, SECURE ACCESS BOX, AND ALL METAL WORK AND LETTERING. CONTRACTOR RESPONSIBLE FOR ALL ELECTRICAL WIRING, CONTROL AND CONNECTIONS AS REQUIRED FOR COMPLETE OPERATION. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR REINFORCING, FOOTING, ALL METAL AND ELECTRICAL COMPONENTS, ATTACHMENTS, FIT, FINISH AND COLOR OF ALL EXPOSED ITEMS, PRODUCT SAMPLES OF CAST STONE VENEER, MORTAR/GROUT, AND PAINT FOR APPROVAL.
19	0000-999-R	<u>BENCH (FURNISH AND INSTALL)</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL BENCHES AS SPECIFIED. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. INSTALL PER MANUFACTURER STANDARD SPECIFICATIONS WITH STAINLESS STEEL HARDWARE. CONTRACTOR SHALL FURNISH HARDWARE. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED BENCH.
20	0000-999-R	<u>BENCH (INSTALL ONLY)</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO INSTALL BENCHES AS SPECIFIED, FURNISHED BY CITY. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. INSTALL PER MANUFACTURER STANDARD SPECIFICATIONS WITH STAINLESS STEEL HARDWARE. CONTRACTOR SHALL FURNISH HARDWARE. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED BENCH.
21	0000-999-S	<u>LITTER RECEPTACLE (INSTALL ONLY)</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO INSTALL LITTER RECEPTACLES AS SPECIFIED, FURNISHED BY CITY. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. INSTALL PER MANUFACTURER STANDARD SPECIFICATIONS WITH STAINLESS STEEL HARDWARE. CONTRACTOR SHALL FURNISH HARDWARE. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED LITTER RECEPTACLE.

22	0000-999-T	<u>BIKE RACK (INSTALL ONLY)</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO INSTALL BIKE RACKS AS SPECIFIED, FURNISHED BY CITY. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. INSTALL PER MANUFACTURER STANDARD SPECIFICATIONS WITH STAINLESS STEEL HARDWARE. CONTRACTOR SHALL FURNISH HARDWARE. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED BIKE RACK CONFIGURATION.
23	0000-999-U	<u>FLAG POLE</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL FLAGPOLE WITH FOOTING. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. INSTALL PER MANUFACTURER STANDARD SPECIFICATIONS. ALL REQUIRED ACCESSORIES FOR COMPLETE OPERATION SHALL BE CONSIDERED INCIDENTAL. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED FLAG POLE.
24	0000-999-V	<u>PLANTER POT, 36" X 36"</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL PLANTER POTS AS SPECIFIED. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. CONFIRM FINAL LOCATIONS WITH ENGINEER OR OWNER PRIOR TO PLACEMENT. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED PLANTER POT.
25	0000-999-V	<u>PLANTER POT, 42" X 42"</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL PLANTER POTS AS SPECIFIED. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. CONFIRM FINAL LOCATIONS WITH ENGINEER OR OWNER PRIOR TO PLACEMENT. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED PLANTER POT.
26	0000-999-W	<u>STANDING HEIGHT TABLE</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL STANDING TABLES AS SPECIFIED. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. INSTALL PER MANUFACTURER STANDARD SPECIFICATIONS WITH STAINLESS STEEL HARDWARE. CONTRACTOR SHALL FURNISH HARDWARE. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH INSTALLED STANDING TABLE.
27	0000-999-X	<u>CAST STONE SEATWALL TYPE 'A'</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH MATERIALS AND CONSTRUCT CAST STONE SEATWALL TYPE 'A'. B. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. C. ITEM IS TO BE MEASURED AND PAID FOR ON A LINEAR FOOT BASIS OF CAST STONE SEATWALL TYPE 'A' CONSTRUCTED. D. ALL ITEMS NECESSARY FOR COMPLETE PROCUREMENT AND INSTALLATION OF CAST STONE, SEALING OF JOINTS, AND BACKFILLING REQUIRED FOR COMPLETE CONSTRUCTION OF THE WALLS AS RECOMMENDED BY THE MANUFACTURER. EXCAVATION, FOOTINGS, REINFORCEMENT, AND MODIFIED SUBBASE ARE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ALL COMPONENTS.
28	0000-999-Y	<u>CAST STONE SEATWALL TYPE 'B'</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH MATERIALS AND CONSTRUCT CAST STONE SEATWALL TYPE 'B'. B. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. C. ITEM IS TO BE MEASURED AND PAID FOR ON A LINEAR FOOT BASIS OF CAST STONE SEATWALL TYPE 'B' CONSTRUCTED. D. ALL ITEMS NECESSARY FOR COMPLETE PROCUREMENT AND INSTALLATION OF CAST STONE, SEALING OF JOINTS, AND BACKFILLING REQUIRED FOR COMPLETE CONSTRUCTION OF THE WALLS AS RECOMMENDED BY THE MANUFACTURER. EXCAVATION, FOOTINGS, REINFORCEMENT, MODIFIED SUBBASE, LINEAR LIGHTING, CONDUIT AND CIRCUITRY ARE CONSIDERED INCIDENTAL TO THIS ITEM. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ALL COMPONENTS.
29	0000-999-Z	<u>ELECTRICAL WIRING, CONDUIT, AND DISTRIBUTION PEDESTALS</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE DISTRIBUTION PEDESTALS AND THE CONDUIT AND WIRE. SEE P SHEETS FOR DETAILS.
30	0000-999-AA	<u>HANDHOLE (HH-1 AND HH-2)</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE HANDHOLES (HH-1 AND HH-2). SEE P SHEETS FOR LOCATIONS AND DETAILS.
31	0000-999-AB	<u>HANDHOLE (HH-3)</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE HANDHOLES (HH-3). SEE P SHEETS FOR LOCATIONS AND DETAILS.
32	0000-999-AB	<u>TYPE S1, S1A, S1B LIGHT POLE ASSEMBLY</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S1, S1A, AND S1B LIGHT POLE ASSEMBLIES. SEE P SHEETS FOR LOCATIONS AND DETAILS.
33	0000-999-AC	<u>TYPE S2A, S2B, S2C, S2D LIGHT POLE ASSEMBLY</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S2A, S2B, S2C AND S2D LIGHT POLE ASSEMBLIES. SEE P SHEETS FOR LOCATIONS AND DETAILS.
34	0000-999-AD	<u>TYPE S2 LIGHT POLE ASSEMBLY</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S2 LIGHT POLE ASSEMBLIES. SEE P SHEETS FOR LOCATIONS AND DETAILS.
35	0000-999-AE	<u>TYPE S3 LIGHT POLE ASSEMBLY</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S3 LIGHT POLE ASSEMBLIES. SEE P SHEETS FOR LOCATIONS AND DETAILS.
36	0000-999-AE	<u>TYPE S3C, S3D LIGHT POLE ASSEMBLY</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S3C AND S3D LIGHT POLE ASSEMBLIES. SEE P SHEETS FOR LOCATIONS AND DETAILS.
37	0000-999-AE	<u>TYPE S4 LIGHT POLE ASSEMBLY</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S4 LIGHT POLE ASSEMBLIES. SEE P SHEETS FOR LOCATIONS AND DETAILS.
38	0000-999-AF	<u>TYPE S3F CATENARY LIGHTING ASSEMBLY</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE TYPE S3F CATENARY LIGHTING ASSEMBLY. SEE P SHEETS FOR LOCATIONS AND DETAILS.
39	0000-999-AG	<u>LIGHT POLE FOUNDATION</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL LIGHT POLE FOUNDATIONS. SEE P SHEETS FOR DETAILS.
40	0000-999-AH	<u>EVENT POWER PEDESTAL (PED-1)</u> THIS ITEM SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT TO INSTALL THE EVENT POWER PEDESTALS (PED-1). SEE SHEET P.02 FOR LOCATIONS AND SHEET P.08 FOR DETAILS.
41	0000-999-AI	<u>TREE PROTECTION</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO PROVIDE TREE PROTECTION FOR TREES INDICATED AS BEING PROTECTED. REFER TO F SHEETS LOCATIONS AND B SHEETS FOR DETAILS. B. CONTRACTOR SHALL MAINTAIN TREE PROTECTION FOR DURATION OF THE PROJECT AND REMOVE UPON COMPLETION. C. ITEM IS TO BE PAID ON A COUNT BASIS PER EACH TREE PROTECTED.



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CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

ESTIMATE REFERENCE NOTES

SHEET

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42	0000-999-AJ	REMOVE AND REINSTALL LINCOLN HIGHWAY MARKER A. THIS ITEMS INCLUDES THE REMOVAL AND REINSTALLATION OF THE LINCOLN HIGHWAY MARKER. B. THIS ITEM SHALL INCLUDE REMOVAL OF EXISTING SIGN AND FOUNDATION AND INSTALLATION OF NEW FOOTING AND EXISTING LINCOLN HIGHWAY MARKER.
43	0000-999-AK	<u>CONCRETE PLANTING BED EDGE</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL CONCRETE PLANTING BED EDGE. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. ITEM SHALL INCLUDE ALL REINFORCING, COMPACTED AGGREGATE BASE AND SAW-CUT RELIEF JOINTS AS INCIDENTAL TO THE BID ITEM. C. ITEM IS TO BE PAID ON A LINEAR FOOT BASIS FOR CONCRETE PLANTING BED EDGE INSTALLED. D. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT WILL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED FOR ANY WORK ON THE PROJECT. E. CONCRETE TESTING WILL BE PROVIDED BY THE CONTRACTOR.
44	2010-C	<u>CLEARING AND GRUBBING</u> A. REFER TO THE R SHEETS FOR LOCATIONS. CLEARING AND GRUBBING LOCATIONS SHALL BE MARKED OUT AND APPROVED BY THE ENGINEER PRIOR TO BEGINNING OF OPERATIONS. CONTRACTOR SHALL TAKE CARE TO PROTECT ALL TREES AND OTHER PLANT MATERIALS THAT ARE NOT IDENTIFIED AS REMOVAL.
45	2010-D-2	<u>AMENDED PLANTING SOIL</u> A. INCLUDES EXCAVATION FOR, FURNISHING AND PLACEMENT OF AMENDED PLANTING SOIL FOR PLANTING BEDS. B. SOIL MIX IS CALLED OUT ON K.00, LOCATIONS ARE SHOWN ON K SHEETS, SEE B SHEETS FOR DETAILS. SOIL MIX MUST BE APPROVED BY ENGINEER. SUBMIT MATERIAL SOURCE INFO, SOIL ANALYSIS AND SAMPLE OF MIX FOR REVIEW. C. AMENDED PLANTING SOIL SHALL BE MEASURED BY CY INSTALLED.
46	2010-D-3	<u>TOPSOIL, OFF-SITE, 8 INCH</u> A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING, HAULING AND SPREADING TOPSOIL. B. PAYMENT WILL BE BASED ON CONTRACT QUANTITY. QUANTITY IS BASED ON PLACING A MINIMUM 8" DEPTH OF TOPSOIL ON ALL AREAS THAT ARE DISTURBED. QUANTITY IS FOR MATERIAL IN PLACE (SHRINKAGE NOT INCLUDED)
47	2010-D-4	<u>STRUCTURAL SOIL (TREE PLANTING)</u> A. THIS ITEM INCLUDES OVER-EXCAVATION AS WELL AS FURNISHING, MIXING, PLACEMENT, AND LEVELING OF THE STRUCTURAL SOIL. B. STRUCTURAL SOIL SHALL BE MEASURED BY CY INSTALLED. C. LOCATIONS ARE SHOWN ON THE K SHEETS, SEE B SHEETS FOR DETAILS. MUST BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT BY THE CONTRACTOR. D. SEE SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.
48	2010-E	<u>EXCAVATION, CLASS 13</u> A. THIS ITEM SHALL INCLUDE HAULING AND PLACEMENT OF THE MATERIAL WITHIN THE GRADING LIMITS, HAULING AND PLACEMENT OF EXCESS SOIL (WASTE), HAULING AND PLACEMENT OF BORROW MATERIAL, AND MATERIAL TESTING IN ACCORDANCE WITH THE SPECIFICATIONS AND THESE PLANS. B. ITEM SHALL NOT INCLUDE FURNISHING AND SPREADING OF TOPSOIL. C. THE CONTRACTOR SHALL DISPOSE OF EXCESS MATERIAL AND MATERIAL THAT IS NOT SUITABLE FOR EMBANKMENT CONSTRUCTION TO LOCATIONS AS SECURED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. D. THE FINISHED GRADE SHALL BE OF UNIFORM CROSS-SECTION AND APPROVED BY THE ENGINEER PRIOR TO PLACEMENT OF THE SUBBASE. E. THIS ITEM SHALL INCLUDE THE REMOVAL OF TROLLEY/RAILROAD TIES AND/OR BALAST IF NO RAILS ARE PRESENT INCLUDING BOTH WOOD AND CONCRETE TIES. F. CONTRACTOR SHALL NOTIFY CITY OF ANY DISPUTE WITH EXCAVATION PLAN QUANTITY PRIOR TO CONSTRUCTION, OTHERWISE PLAN QUANTITY WILL BE USED FOR PAYMENT. PAYMENT SHALL BE PLAN QUANTITY. G. DIRT QUANTITIES ASSUMED AN AVERAGE EXISTING PAVEMENT THICKNESS OF 8". EXCAVATION QUANTITIES WERE CALCULATED FROM BOTTOM OF EXISTING PAVEMENT TO BOTTOM OF PROPOSED SUBBASE. CUT = 5,350 CY, FILL + 30% = 144 CY, NET = 5,206 EXCESS
49	2010-G	<u>SUBGRADE PREPARATION, 12 INCH</u> A. INCLUDES SUBGRADE PREPARATION FOR ALL ROADWAY PAVEMENT TO A DEPTH OF 12 INCHES. B. QUANTITY IS BASED ON THE AREA OF 12 INCH SUBGRADE PREPARATION, COMPLETED IN 2 - 6" LIFTS, EXTENDING 2 FOOT BEYOND THE PAVEMENT EDGE. C. IN INSTANCES OF CONFLICT WITH EXISTING UTILITIES, THE DEPTH MAY BE REDUCED AS DIRECTED BY THE ENGINEER. D. PREPARATION UNDER ENTRANCES, DRIVES, SIDEWALKS, AND PATHS IS INCIDENTAL TO THOSE ITEMS. E. THIS ITEMS INCLUDES ALL MOISTURE AND DENSITY TESTING TO BE PROVIDED BY THE CONTRACTOR. F. PRIOR TO COMPLETING SUBGRADE PREPARATION, THE CONTRACTOR SHALL PROOF ROLL THE AREA. IF THE PROOF ROLL PASSES, THE ENGINEER MAY ELECT TO NOT HAVE SUBGRADE PREPARATION PERFORMED IN THAT AREA. THE PROOF ROLL SHALL BE INCIDENTAL TO EXCAVATION
50	2010-H	<u>GRANULAR STABILIZATION</u> A. THIS ITEMS SHALL BE USED FOR REPLACEMENT OF UNSTABLE SUBGRADE MATERIAL. B. MATERIAL SHALL MEET THE REQUIREMENTS OF SUDAS 2010.2.04.B
51	2010-I	<u>SUBGRADE TREATMENT, MULTIAXIAL GEO-GRID</u> A. THIS PAY ITEM SHALL BE FOR THE FURNISHING AND INSTALLATION OF THE GEOGRID USED IN THE ROADWAY CONSTRUCTION AND EXTEND 2 FEET BEYOND THE BACK OF CURB B. THIS ITEM SHALL COVER ALL MATERIAL, LABOR AND COSTS ASSOCIATED WITH INSTALLATION OF THE GEOGRID. C. GEOGRID SHALL BE TYPE 4
52	2010-J	<u>SUBBASE, MODIFIED, 4 INCHES</u> A. REFER TO B SHEETS FOR TYPICAL SECTIONS. BID ITEM SHALL BE USED UNDER ALL SIDEWALKS, EXTENDING 1' BEYOND THE EDGE OF PAVEMENT WHEN POSSIBLE
53	2010-J	<u>SUBBASE, MODIFIED, 6 INCHES</u> A. REFER TO B SHEETS FOR TYPICAL SECTIONS. BID ITEM SHALL BE USED UNDER ALL DRIVEWAY AND ALLEY PAVEMENT SECTIONS.
54	2010-J	<u>SUBBASE, MODIFIED, 8 INCHES</u> A. REFER TO B SHEETS FOR TYPICAL SECTIONS. BID ITEM SHALL BE USED UNDER ALL ROADWAY PAVEMENT SECTIONS EXTENDING 2 FEET BEYOND THE PAVEMENT EDGE.
55	2010-K-1-A	<u>REMOVAL OF STRUCTURE, ELECTRICAL METER</u> A. THIS ITEM INCLUDES THE REMOVAL OF EXISTING ELECTRICAL METERS THAT ARE NO LONGER NEEDED DUE TO THE PROPOSED ELECTRICAL IMPROVEMENTS. B. ELECTRICAL METERS ARE LOCATED IN TWO LOCATIONS. ONE IN THE ALLEY OFF OF N. CENTER STREET ADJACENT TO CENTER STREET STATION AND ONE IN THE NORTH ALLEY BETWEEN 1ST AVE AND 2ND AVE OFF MAIN STREET ADJACENT TO 7 RAYOS. C. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL COMPANY, ALLIANT, ON POWER DISCONNECT AND METER REMOVAL. D. CONTRACTOR SHALL BE RESPONSIBLE TO PATCH ANY PAVEMENT OR WALL AS NECESSARY WHEN METER IS REMOVED AS PART OF THIS BID ITEM E. THIS ITEM TO BE MEASURED BY EACH METER REMOVED.

56	2010-K-1-A	<u>REMOVAL OF STRUCTURE, LIGHT POLE FOOTING</u> A. THIS ITEM INCLUDES THE DEMOLITION OF EXISTING LIGHT POLES AND FOUNDATIONS. THIS BID ITEMS INCLUDES FULL REMOVAL OF ALL LIGHT POLE FOOTINGS. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL LIGHT. CITY OF MARSHALLTOWN MAY SALVAGE PIECES OR PARTS OF EXISTING LIGHTS PRIOR TO REMOVAL. B. CONTRACTOR SHALL SALVAGE AND PROVIDE TO THE CITY 3 DOUBLE HEADED LIGHTS FROM MAIN STREET AND 3 SINGLE HEADED LIGHTS FROM STATE STREET. CONTRACTOR SHALL COORDINATE WITH CITY STAFF PRIOR TO REMOVAL FOR THE CITY TO SELECT THE LIGHTS THEY WOULD LIKE TO BE SALVAGED. THIS IS INCIDENTAL TO THIS ITEM. B. THIS ITEM TO BE MEASURED BY EACH FOUNDATION REMOVED. C. PAYMENT FOR THIS ITEM SHALL BE AT THE CONTRACT UNIT PRICE PER EACH FOOTING REMOVED. THIS PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED TO REMOVE EACH LIGHTS INCLUDING THE LIGHT.
57	2010-K-1-A	<u>REMOVAL OF STRUCTURE, HANDHOLE</u> A. THIS ITEM INCLUDES THE DEMOLITION OF EXISTING HANDHOLES. THIS BID ITEMS INCLUDES FULL REMOVAL AND DISPOSAL OF ALL HANDHOLES. CONDUIT AND WIRE REMOVAL BETWEEN HANDHOLES WILL BE CONSIDERED INCIDENTAL TO THIS ITEM. B. THIS ITEM TO BE MEASURED BY EACH HANDHOLE REMOVED. C. PAYMENT FOR THIS ITEM SHALL BE AT THE CONTRACT UNIT PRICE PER EACH HANDHOLE REMOVED.
58	2010-K-1-A	<u>REMOVAL OF STRUCTURE, FLAG POLE</u> A. THIS ITEM INCLUDES THE DEMOLITION OF EXISTING FLAG POLES INCLUDING FOUNDATIONS ON THE COURTHOUSE LAWN. THIS BID ITEM INCLUDES FULL REMOVAL AND DISPOSAL OF ALL FLAG POLES AND FOOTINGS, B. THIS ITEM TO BE MEASURED BY EACH FLAG POLE REMOVED. C. PAYMENT FOR THIS ITEM SHALL BE AT THE CONTRACT UNIT PRICE PER EACH FLAG POLE REMOVED. THIS PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED TO REMOVE EACH FLAG POLE
59	2010-K-1-A	<u>REMOVAL OF STRUCTURE, MISC. SITE FURNISHINGS</u> A. THIS ITEM SHALL INCLUDE THE REMOVAL AND DISPOSAL OF ALL MISCELLANEOUS SITE FURNISHINGS INCLUDING BUT NOT LIMITED TO TRASH CANS, BIKE RACKS, ETC. B. THIS ITEM SHALL BE PAID LUMP SUM REGARDLESS OF THE NUMBER OF FURNISHINGS REMOVED.
60	2010-K-1-B	<u>TROLLEY TRACK REMOVAL</u> A. THIS ITEM SHALL INCLUDE ALL LABOR AND MATERIALS REQUIRED FOR REMOVAL OF TROLLEY TRACKS LOCATED WITHIN THE PROJECT LIMITS. THIS WILL INCLUDE PROPER DISPOSAL AND REMOVAL OF ALL MATERIALS ASSOCIATED WITH REMOVAL OF FOUND TROLLEY TRACKS. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE, ONLY QUANTITY APPROVED WILL BE PAID. C. THIS ITEM INCLUDES THE REMOVAL OF BOTH RAILS, ALL TIES, AND ASSOCIATED INFRASTRUCTURE. D. REMOVAL SHALL BE MEASURED PER FOOT OF REMOVAL INCLUDING 2 TRACKS, TIES AND ASSOCIATED INFRASTRUCTURE IN EACH FOOT. SEPARATE PAYMENT FOR EACH INDIVIDUAL RAIL WILL NOT BE PAID. E. IF THE RAIL HAS BEEN REMOVED AND ONLY TIES OR OTHER BEDDING ARE FOUND THEY SHALL BE REMOVED AS PART OF THE CLASS 13 EXCAVATION. NO PAYMENT SHALL BE MADE UNLESS THE RAILS ARE PRESENT.
61	2010-M	<u>COMPACTION TESTING</u> A. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COMPACTION TESTING FOR THE PROJECT INCLUDING EXCAVATION, SUBGRADE PREP AND SUBBASE MATERIAL PERFORMED BY AN INDEPENDENT TESTING LABORATORY. B. CONTRACTOR SHALL COMPLETE COMPACTION TESTING PER SUDAS. C. THE CONTRACTOR WILL BE RESPONSIBLE FOR PAYMENTS ASSOCIATED WITH ALL RETESTING RESULTING FROM FAILURE OF INITIAL TESTS.
62	2010-999-A	<u>EXPLORATORY EXCAVATION</u> A. THIS ITEM IS FOR THE INVESTIGATION OF LOCATIONS AND ELEVATIONS OF AN UNKNOWN UTILITY OR OBSTRUCTION TO VERIFY THE POTENTIAL FOR CONFLICTS. CONTRACTOR HAS THE OPTION TO USE OPEN EXCAVATION OR VACUUM TYPE EQUIPMENT TO PERFORM THE EXCAVATION DEPENDING UPON SITE CONDITIONS. PAYMENT INCLUDES THE PROPER BACKFILLING OF THE EXCAVATION AND THE ENGINEER OR THEIR REPRESENTATIVE MUST VERIFY THE CONDITIONS FOUND. CONTRACTOR SHALL RECORD ALL LOCATIONS, ELEVATIONS AND DIMENSIONS OF UTILITIES FOUND FOR DISTRIBUTION TO THE OWNER AND ENGINEER. INFORMATION PROVIDED BY CONTRACTOR WILL BE ANALYZED PRIOR TO UNDERGROUND WORK COMMENCING TO ELIMINATE ANY UNFORESEEN CONFLICTS. B. THIS ITEM IS NOT INTENDED TO FIND KNOWN UTILITY LOCATIONS AS IDENTIFIED IN THE CONTRACT DOCUMENTS OR THROUGH THE IOWA ONE CALL UTILITY LOCATE PROCESS. C. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE, ONLY QUANTITY APPROVED WILL BE PAID. D. USE OF THIS ITEM MUST BE PREAUTHORIZED BY THE OWNER/ENGINEER PRIOR TO WORK.
63	3010-C	<u>TRENCH FOUNDATION</u> A. THIS ITEM SHALL INCLUDE, BUT IS NOT LIMITED TO, REMOVAL AND DISPOSAL OF OVER-EXCAVATED MATERIAL REQUIRED TO STABILIZE TRENCH FOUNDATION BELOW PIPE BEDDING; FURNISHING, HAULING, AND PLACING STABILIZATION MATERIAL. B. STABILIZATION MATERIAL SHALL BE A CLEAN 2 1/2 INCH CRUSHED STONE MEETING THE GRADATION PRESENTED IN TABLE 3010.06 OF THE STANDARD SPECIFICATIONS. C. TRENCH FOUNDATION SHALL BE USED UPON APPROVAL FROM THE ENGINEER. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE, ONLY QUANTITY APPROVED WILL BE PAID.
64	3010-D	<u>REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL</u> A. THIS ITEM WILL BE CUBIC YARD AND USED TO REMOVE AND REPLACE UNSUITABLE MATERIAL DURING STANDARD TRENCH EXCAVATION LOCATED ABOVE TRENCH BACKFILL WHEN EXISTING MATERIAL IS NOT SUITABLE TO BE PLACED BACK IN THE TRENCH. THIS ITEM COVERS REMOVAL OF EXISTING UNSUITABLE MATERIAL, FURNISHING AND PLACING OF SUITABLE MATERIAL MEETING THE REQUIREMENTS OF SUDAS SECTION 2010.203. THE CONTRACTOR SHALL PROVIDE TESTING INFORMATION ON PROPOSED REPLACEMENT MATERIAL PRIOR TO PLACING IN TRENCH B. PRIOR APPROVAL OF THE ENGINEER OR REPRESENTATIVE WILL BE REQUIRED. C. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE, ONLY QUANTITY APPROVED WILL BE PAID.
65	3010-F	<u>TRENCH COMPACTION TESTING</u> A. THE CONTRACTOR IS RESPONSIBLE FOR TRENCH COMPACTION TESTING PERFORMED BY AN INDEPENDENT TESTING LABORATORY. B. CONTRACTOR SHALL COMPLETE COMPACTION TESTING PER SUDAS REQUIREMENTS DURING THE CONSTRUCTION PROCESS PRIOR TO COMPLETION OF BACKFILL OPERATIONS UTILIZING MOISTURE AND DENSITY METHODS. C. THE CONTRACTOR WILL BE RESPONSIBLE FOR PAYMENTS ASSOCIATED WITH ALL RETESTING RESULTING FROM FAILURE OF INITIAL TESTS. D. ENGINEER SHALL BE NOTIFIED IMMEDIATELY WHEN CONDITIONS EXIST THAT PROHIBIT PROPER TRENCH COMPACTION. IT WILL BE NECESSARY FOR THE CONTRACTOR TO REWORK, RECOMPACT AND RETEST AS NECESSARY UNTIL SPECIFIED COMPACTION AND MOISTURE CONTENT IS ACHIEVED IN ALL AREAS OF THE TRENCH. THE ENGINEER MAY REQUIRE RETESTING AS DEEMED NECESSARY.



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CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

ESTIMATE REFERENCE NOTES

SHEET

C.05

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66	3010-999-A	DISPOSAL OF CONTAMINATED SOIL A. THIS ITEM IS FOR ESTABLISHING A UNIT PRICE FOR DISPOSAL OF CONTAMINATED SOILS ENCOUNTERED ON THE PROJECT. B. THIS ITEM SHALL INCLUDE LOADING, HAULING AND DUMPING AT AN APPROVED FACILITY AND REPLACEMENT WITH CLEAN NON-CONTAINED FILL DIRT. C. THIS ITEM INCLUDES HIRING AN ENVIRONMENTAL CONSULTANT TO PROVIDE ON-SITE FIELD SCREENING TO DETERMINE IF SOIL IS CONTAMINATED AND COMPLETING THE REQUIRED TESTING NEEDED ON ANY SUSPECTED CONTAMINATED SOILS PRIOR TO DISPOSAL. D. SOIL SUSPECTED OF BEING CONTAMINATED (I.E., ABOVE IDNR ACTION LEVELS) SHOULD BE SEGREGATED, PROPERLY CONTAINED ON SITE, SAMPLED, AND ANALYZED INITIALLY WITH FIELD SCREENING EQUIPMENT AND SUBSEQUENT LABORATORY ANALYSIS IF WARRANTED AS DETERMINED BY ELEVATED FIELD SCREENING VAPOR ANALYSIS RESULTS. THE CONTRACTOR IS RESPONSIBLE FOR PROPER CONTAINMENT, STAGING, CHARACTERIZATION, AND DISPOSAL OF MATERIALS DETERMINED AS CONTAMINATED. E. IF SUSPECTED GROSS SOIL CONTAMINATION IS CONFIRMED ABOVE IDNR ACTION LEVELS THROUGH SAMPLING AND LABORATORY ANALYSIS, THE CONTRACTOR SHOULD NOTIFY THE PROJECT ENGINEER AND THE IDNR UNDERGROUND STORAGE TANK SECTION AT (515) 281-8011. IF THE IDNR DETERMINES THE SOIL DOES NOT MEET THE DEFINITION OF "HAZARDOUS CONDITION" UNDER 567 IAC CHAPTER 131, THE SOIL MAY BE REGRADED OR CONSOLIDATED ON SITE. F. IF THE SOIL DOES MEET THE DEFINITION OF A HAZARDOUS CONDITION, THE SOIL SHOULD BE DISPOSED OF AT AN IDNR-PERMITTED LAND FARM OR AS OTHERWISE DIRECTED BY THE IDNR G. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPMENT AND IMPLEMENTATION OF A SITE-SPECIFIC HEALTH AND SAFETY PLAN ADDRESSING POTENTIAL HAZARDS ASSOCIATED WITH PETROLEUM IMPACTED SOIL AND/OR GROUNDWATER. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR COMPLETING WORK IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND FOR ENSURING THE HEALTH AND SAFETY OF THEIR EMPLOYEES AND SUBCONTRACTOR'S EMPLOYEES. H. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE, ONLY QUANTITY APPROVED WILL BE PAID.
67	3010-999-A	DISPOSAL OF CONTAMINATED GROUND WATER A. THIS ITEM IS FOR ESTABLISHING A UNIT PRICE FOR DISPOSAL OF CONTAMINATED GROUND WATER ENCOUNTERED ON THE PROJECT. B. THIS ITEM SHALL INCLUDE LOADING, HAULING AND DISPOSED AT AN APPROPRIATELY PERMITTED WASTEWATER TREATMENT AND DISPOSAL VENDOR. C. THIS ITEM INCLUDES HIRING AN ENVIRONMENTAL CONSULTANT TO PROVIDE ON-SITE FIELD SCREENING TO DETERMINE IF GROUNDWATER IS CONTAMINATED AND COMPLETING THE REQUIRED TESTING NEEDED ON ANY SUSPECTED CONTAMINATED SOILS PRIOR TO DISPOSAL. D. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE PROJECT ENGINEER OF SUSPECTED GROSS GROUNDWATER CONTAMINATION. GROUNDWATER SUSPECTED OF BEING CONTAMINATED DUE TO THE PRESENCE OF STRONG ODORS OR FREE PETROLEUM PRODUCT FLOATING ON THE GROUNDWATER SHOULD BE SAMPLED AND ANALYZED BY THE CONTRACTOR TO DETERMINE PROPER DISPOSAL METHODS. E. IF SUSPECTED GROSS GROUNDWATER CONTAMINATION IS CONFIRMED ABOVE IDNR ACTION LEVELS THROUGH SAMPLING AND LABORATORY ANALYSIS OR THE PRESENCE OF FREE PETROLEUM PRODUCT FLOATING ON THE GROUNDWATER, THE CONTRACTOR SHOULD NOTIFY THE PROJECT ENGINEER AND THE IDNR UNDERGROUND STORAGE TANK SECTION AT (515) 281-8011. DEWATERED CONTAMINATED (I.E., ABOVE IDNR ACTION LEVELS) GROUNDWATER SHOULD BE DISPOSED OF BY AN APPROPRIATELY PERMITTED WASTEWATER TREATMENT AND DISPOSAL VENDOR. F. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPMENT AND IMPLEMENTATION OF A SITE-SPECIFIC HEALTH AND SAFETY PLAN ADDRESSING POTENTIAL HAZARDS ASSOCIATED WITH PETROLEUM IMPACTED SOIL AND/OR GROUNDWATER. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR COMPLETING WORK IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS AND FOR ENSURING THE HEALTH AND SAFETY OF THEIR EMPLOYEES AND SUBCONTRACTOR'S EMPLOYEES. G. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE, ONLY QUANTITY APPROVED WILL BE PAID.
68	4020-A-1	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - SHORT SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE SHORT SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.
69	4020-A-1	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - LONG SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE LONG SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.
70	4020-A-1	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - SHORT SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE SHORT SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.
71	4020-A-1	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - LONG SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE LONG SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.
72	4020-A-1	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - SHORT SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE SHORT SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.
73	4020-A-1	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - LONG SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE LONG SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.
74	4020-A-1	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - SHORT SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE SHORT SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.
75	4020-A-1	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - LONG SIDE A. THIS ITEM IS TO ESTABLISH A UNIT PRICE FOR SUMP PUMP CONNECTION. B. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR CONNECTION OF EXISTING SUMP PUMP OUTLET TO PROPOSED STORM SEWER ON THE LONG SIDE OF THE ROADWAY REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID. C. ITEMS INCLUDED ALL LABOR AND MATERIALS NEEDED TO MAKE CONNECTION TO EXISTING SUMP PUMP, NEW PVC PIPE, AND CONNECTION TO PROPOSED STORM SEWER.

76	4020-A-1	STORM SEWER, TRENCHED, PVC, 10 INCH A. REFER TO C SHEETS FOR TABULATIONS. REFER TO SHEETS M SHEETS FOR STORM LOCATIONS. B. BEDDING CLASS SHALL BE F-2 FOR ALL PVC PIPES. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING BEDDING MATERIAL, PLACING BEDDING AND BACKFILL MATERIAL AND OTHER FITTINGS, PIPE JOINTS, EXISTING PIPE CONNECTIONS, TESTING, AND INSPECTION. D. CONTRACTOR SHALL TELEWISE ALL STORM SEWERS AND TURN OVER DATA TO CITY UPON COMPLETION OF THE TESTING AND INSPECTION PRIOR TO SUBGRADE PREPARATION. DATA SUBMITTAL TO BE APPROVED BY ENGINEER. ANY VISIBLE DAMAGE SHALL BE REPAIRED REGARDLESS OF SEVERITY. CONTRACTOR SHALL RE-VIDEO ANY REQUIRED REPAIRS AND PROVIDE VIDEO TO THE CITY AT NO ADDITIONAL COST. E. POTHOLING FOR INSTALLATION OF THIS ITEM SHALL BE INCIDENTAL TO THIS BID ITEM UNLESS AUTHORIZED BY THE ENGINEER. F. ITEM IS TO ESTABLISH UNIT PRICE. CONTRACTOR SHALL INVESTIGATE AND DETERMINE IF EXISTING ROOF DRAINS ARE PRESENT. IF DRAIN ARE PRESENT CONTRACTOR SHALL UTILIZE BID ITEM TO CONNECT EXISTING ROOF DRAINS TO STORM SEWER NETWORK. IF ROOF DRAINS ARE NOT PRESENT THE ITEM SHALL NOT BE USED.
77	4020-A-1	STORM SEWER, TRENCHED, PVC, 12 INCH A. ITEM IS TO ESTABLISH UNIT PRICE FOR ITEM. ITEM SHALL BE USED TO CONNECT TO EXISTING ROOF DRAIN CONNECTIONS FROM THE COURTHOUSE AND TIE INTO A NEW STORM SEWER STRUCTURE. COURTHOUSE HAS 4 EXISTING ROOF DRAINS, 2 ON THE NORTH SIDE OF THE BUILDING AND 2 ON THE WEST SIDE OF THE BUILDING. EXISTING LOCATIONS ARE UNKNOWN AND THIS ITEM SHALL BE USED TO CONNECT TO EXISTING PIPE AS NEEDED WHEN THEY ARE ENCOUNTERED. B. BEDDING CLASS SHALL BE F-2 FOR ALL PVC PIPES. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING BEDDING MATERIAL, PLACING BEDDING AND BACKFILL MATERIAL AND OTHER FITTINGS, PIPE JOINTS, EXISTING PIPE CONNECTIONS, TESTING, AND INSPECTION. D. CONTRACTOR SHALL TELEWISE ALL STORM SEWERS AND TURN OVER DATA TO CITY UPON COMPLETION OF THE TESTING AND INSPECTION PRIOR TO SUBGRADE PREPARATION. DATA SUBMITTAL TO BE APPROVED BY ENGINEER. ANY VISIBLE DAMAGE SHALL BE REPAIRED REGARDLESS OF SEVERITY. CONTRACTOR SHALL RE-VIDEO ANY REQUIRED REPAIRS AND PROVIDE VIDEO TO THE CITY AT NO ADDITIONAL COST. E. POTHOLING FOR INSTALLATION OF THIS ITEM SHALL BE INCIDENTAL TO THIS BID ITEM UNLESS AUTHORIZED BY THE ENGINEER.
78	4020-A-1	STORM SEWER, TRENCHED, RCP, 15 INCH A. REFER TO C SHEETS FOR TABULATIONS. REFER TO SHEETS M SHEETS FOR STORM LOCATIONS. B. BEDDING CLASS SHALL BE R-2 FOR ALL RCP PIPES. TYPE OF PIPE ALLOWED SHALL BE RCP, CLASS III. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING BEDDING MATERIAL, PLACING BEDDING AND BACKFILL MATERIAL, JOINT WRAPPING AND OTHER FITTINGS, PIPE JOINTS, EXISTING PIPE CONNECTIONS, TESTING, AND INSPECTION. D. THE JOINTS WILL BE WRAPPED WITH ENGINEERING FABRIC AND IN ADDITION WHEN CROSSING WATER MAINS ONE FULL LENGTH OF RCP WITH FLEXIBLE O-RING GASKETED JOINTS WILL BE REQUIRED SO BOTH JOINTS ARE AS FAR AS POSSIBLE FROM THE WATER MAIN. E. CONTRACTOR SHALL TELEWISE ALL STORM SEWERS AND TURN OVER DATA TO CITY UPON COMPLETION OF THE TESTING AND INSPECTION PRIOR TO SUBGRADE PREPARATION. DATA SUBMITTAL TO BE APPROVED BY ENGINEER. ANY VISIBLE DAMAGE SHALL BE REPAIRED REGARDLESS OF SEVERITY. CONTRACTOR SHALL RE-VIDEO ANY REQUIRED REPAIRS AND PROVIDE VIDEO TO THE CITY AT NO ADDITIONAL COST. F. BID ITEM INCLUDES SEWER PIPE SUPPORT WHERE SEPARATION IS LESS THAN 18". REFER DETAIL B SHEETS AND M SHEETS FOR LOCATIONS. G. POTHOLING FOR INSTALLATION OF THIS ITEM SHALL BE INCIDENTAL TO THIS BID ITEM UNLESS AUTHORIZED BY THE ENGINEER. H. ALL LOCATIONS THAT HAVE LESS THAN 18" VERTICAL SEPARATION OR 3' HORIZONTAL SEPARATION FROM WATER MAIN SHALL BE GASKETED FROM STRUCTURE TO STRUCTURE.
79	4020-A-1	STORM SEWER, TRENCHED, RCP, 24 INCH A. REFER TO C SHEETS FOR TABULATIONS. REFER TO SHEETS M SHEETS FOR STORM LOCATIONS. B. BEDDING CLASS SHALL BE R-2 FOR ALL RCP PIPES. TYPE OF PIPE ALLOWED SHALL BE RCP, CLASS III. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING BEDDING MATERIAL, PLACING BEDDING AND BACKFILL MATERIAL, JOINT WRAPPING AND OTHER FITTINGS, PIPE JOINTS, EXISTING PIPE CONNECTIONS, TESTING, AND INSPECTION. D. THE JOINTS WILL BE WRAPPED WITH ENGINEERING FABRIC AND IN ADDITION WHEN CROSSING WATER MAINS ONE FULL LENGTH OF RCP WITH FLEXIBLE O-RING GASKETED JOINTS WILL BE REQUIRED SO BOTH JOINTS ARE AS FAR AS POSSIBLE FROM THE WATER MAIN. E. CONTRACTOR SHALL TELEWISE ALL STORM SEWERS AND TURN OVER DATA TO CITY UPON COMPLETION OF THE TESTING AND INSPECTION PRIOR TO SUBGRADE PREPARATION. DATA SUBMITTAL TO BE APPROVED BY ENGINEER. ANY VISIBLE DAMAGE SHALL BE REPAIRED REGARDLESS OF SEVERITY. CONTRACTOR SHALL RE-VIDEO ANY REQUIRED REPAIRS AND PROVIDE VIDEO TO THE CITY AT NO ADDITIONAL COST. F. BID ITEM INCLUDES SEWER PIPE SUPPORT WHERE SEPARATION IS LESS THAN 18". REFER DETAIL B SHEETS AND M SHEETS FOR LOCATIONS. G. POTHOLING FOR INSTALLATION OF THIS ITEM SHALL BE INCIDENTAL TO THIS BID ITEM UNLESS AUTHORIZED BY THE ENGINEER. H. ALL LOCATIONS THAT HAVE LESS THAN 18" VERTICAL SEPARATION OR 3' HORIZONTAL SEPARATION FROM WATER MAIN SHALL BE GASKETED FROM STRUCTURE TO STRUCTURE.
80	4020-A-1	STORM SEWER, TRENCHED, RCP, 36 INCH A. REFER TO C SHEETS FOR TABULATIONS. REFER TO SHEETS M SHEETS FOR STORM LOCATIONS. B. BEDDING CLASS SHALL BE R-2 FOR ALL RCP PIPES. TYPE OF PIPE ALLOWED SHALL BE RCP, CLASS III. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING BEDDING MATERIAL, PLACING BEDDING AND BACKFILL MATERIAL, JOINT WRAPPING AND OTHER FITTINGS, PIPE JOINTS, EXISTING PIPE CONNECTIONS, TESTING, AND INSPECTION. D. THE JOINTS WILL BE WRAPPED WITH ENGINEERING FABRIC AND IN ADDITION WHEN CROSSING WATER MAINS ONE FULL LENGTH OF RCP WITH FLEXIBLE O-RING GASKETED JOINTS WILL BE REQUIRED SO BOTH JOINTS ARE AS FAR AS POSSIBLE FROM THE WATER MAIN. E. CONTRACTOR SHALL TELEWISE ALL STORM SEWERS AND TURN OVER DATA TO CITY UPON COMPLETION OF THE TESTING AND INSPECTION PRIOR TO SUBGRADE PREPARATION. DATA SUBMITTAL TO BE APPROVED BY ENGINEER. ANY VISIBLE DAMAGE SHALL BE REPAIRED REGARDLESS OF SEVERITY. CONTRACTOR SHALL RE-VIDEO ANY REQUIRED REPAIRS AND PROVIDE VIDEO TO THE CITY AT NO ADDITIONAL COST. F. BID ITEM INCLUDES SEWER PIPE SUPPORT WHERE SEPARATION IS LESS THAN 18". REFER DETAIL B SHEETS AND M SHEETS FOR LOCATIONS. G. POTHOLING FOR INSTALLATION OF THIS ITEM SHALL BE INCIDENTAL TO THIS BID ITEM UNLESS AUTHORIZED BY THE ENGINEER. H. ALL LOCATIONS THAT HAVE LESS THAN 18" VERTICAL SEPARATION OR 3' HORIZONTAL SEPARATION FROM WATER MAIN SHALL BE GASKETED FROM STRUCTURE TO STRUCTURE.
81	4020-D	REMOVAL OF STORM SEWER, 36 INCH OR LESS A. REFER TO F SHEETS FOR LOCATIONS. EXISTING PIPE TRENCH SHALL BE FILLED WITH SUITABLE BACKFILL MATERIAL AND SHALL BE INCIDENTAL TO PIPE REMOVAL.
82	4040-A	SUBDRAIN, TYPE 1C, PVC, 6 INCH A. REFER TO M SHEETS FOR LOCATIONS. SUBDRAIN SHALL BE SUDAS CASE C TYPE 1 SUBDRAIN. B. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, TRENCH EXCAVATION, FURNISHING AND PLACEMENT OF BEDDING AND BACKFILL MATERIAL, ENGINEERING FABRIC, CONNECTORS, AND ELBOWS AND TEES. THE LENGTH OF ELBOWS AND TEES OF THE PIPES INSTALLED WILL BE INCLUDED IN THE LENGTH OF PIPE MEASURED.
83	4040-C-1	SUBDRAIN CLEANOUT, TYPE A-1, 6 INCH A. REFER TO M SHEETS FOR LOCATIONS. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, PIPE, NON-SHRINK GROUT, AND COUPLING BANDS. B. SUBDRAIN CLEANOUT SHALL BE TYPE A-1
84	4040-D-1	SUBDRAIN OUTLETS AND CONNECTIONS A. REFER TO M SHEETS FOR SUBDRAIN LOCATIONS. ALL SUBDRAINS SHALL BE CASE C TYPE 1 ACCORDING TO SUDAS FIGURE 4040.231. B. THIS ITEM SHALL INCLUDE ALL THE LABOR AND MATERIAL NECESSARY TO CONNECT PROPOSED SUBDRAIN PIPE TO PROPOSED STRUCTURE, INCLUDING BUT NOT LIMITED TO CORING OR CUTTING INTO THE EXISTING STRUCTURE, PIPE CONNECTIONS, GROUT AND WATER STOP (WHEN REQUIRED)

DESIGNED	DEM	REV	DESCRIPTION	DATE
DRAWN	DEM	A	90% PROGRESS PLANS	12/20/2024
CHECKED	GAB			
CLIENT PROJ. NO.	0A1.129221			

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

ESTIMATE REFERENCE NOTES

SHEET

C.06



**BOLTON
& MENK**

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85	5010-A-1	<u>WATER MAIN, TRENCHED, DIP WITH NITRILE GASKETS, 8 INCH</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS. TRACER WIRE SHALL BE TERMINATED AT EACH HYDRANT IN AN APPROVED TERMINAL POST. TRACER WIRE SHALL NOT BE RUN UP ANY VALVES. D. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. E. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN. F. ANY SERVICE INTERRUPTIONS IMPACTING A BUSINESS THAT REQUIRES WATER FOR PREPARATION OF FOOD OR OTHER NON-RESTROOM USES SHALL REQUIRE ADDITIONAL COORDINATION. EXTRA EFFORT SHALL BE MADE TO SCHEDULE SERVICE INTERRUPTIONS WHEN LEAST IMPACTFUL TO THESE BUSINESSES
86	5010-C-1	<u>FITTING, DUCTILE IRON</u> A. THIS ITEM SHALL INCLUDE, BUT IS NOT LIMITED TO, RESTRAINED JOINT FITTINGS AND THRUST BLOCKS. B. EACH TYPE AND SIZE OF FITTING INSTALLED AS SPECIFIED IN THE CONTRACT DOCUMENTS OR AS REQUIRED FOR PROPER INSTALLATION OF THE WATER MAIN WILL BE COUNTED. C. DETERMINATION OF THE TOTAL WEIGHT OF FITTINGS, IN POUNDS, SHALL BE BASED ON THE STANDARD FITTING WEIGHTS PUBLISHED IN AWWA C153 FOR DUCTILE IRON COMPACT FITTINGS. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ADDITIONAL WEIGHT BEYOND AWWA C153 PUBLISHED WEIGHTS. ACCESSORY PACKS SHALL BE INCIDENTAL TO THE FITTING WITH NO ADDITIONAL PAYMENT FOR WEIGHT.
87	5010-E-1	<u>WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, SHORT SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. THIS ITEM SHALL BE USED TO CONNECT TO A BUILDING THAT HAS AN EXISTING FIRE SERVICE AND MAKING THE CONNECTION TO AN EXISTING FIRE SERVICE LINE. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, CONNECTION TO EXISTING FIRE SERVICE, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. E. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. CONTRACTOR SHALL CONFIRM SIZE OF EXISTING FIRE SERVICE BEFORE INSTALLING TEE ON WATER MAIN. IF SIZE IS DIFFERENT THAN SHOWN ON THE PLANS THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING. F. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
88	5010-E-1	<u>WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, LONG SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. THIS ITEM SHALL BE USED TO CONNECT TO A BUILDING THAT HAS AN EXISTING FIRE SERVICE AND MAKING THE CONNECTION TO AN EXISTING FIRE SERVICE LINE. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, CONNECTION TO EXISTING FIRE SERVICE, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. THIS ITEM SHALL BE USED TO CONNECT TO A BUILDING THAT HAS AN EXISTING FIRE SERVICE AND MAKING THE CONNECTION TO AN EXISTING FIRE SERVICE LINE. E. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS.CONTRACTOR SHALL CONFIRM SIZE OF EXISTING FIRE SERVICE BEFORE INSTALLING TEE ON WATER MAIN. IF SIZE IS DIFFERENT THAN SHOWN ON THE PLANS THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING. F. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
89	5010-E-1	<u>WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, SHORT SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. THIS ITEM SHALL BE USED TO CONNECT TO A BUILDING THAT HAS AN EXISTING FIRE SERVICE AND MAKING THE CONNECTION TO AN EXISTING FIRE SERVICE LINE. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, CONNECTION TO EXISTING FIRE SERVICE, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. E. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. CONTRACTOR SHALL CONFIRM SIZE OF EXISTING FIRE SERVICE BEFORE INSTALLING TEE ON WATER MAIN. IF SIZE IS DIFFERENT THAN SHOWN ON THE PLANS THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING. F. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.

90	5010-E-1	<u>WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, LONG SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. THIS ITEM SHALL BE USED TO CONNECT TO A BUILDING THAT HAS AN EXISTING FIRE SERVICE AND MAKING THE CONNECTION TO AN EXISTING FIRE SERVICE LINE. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, CONNECTION TO EXISTING FIRE SERVICE, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. E. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. CONTRACTOR SHALL CONFIRM SIZE OF EXISTING FIRE SERVICE BEFORE INSTALLING TEE ON WATERMAIN. IF SIZE IS DIFFERENT THAN SHOWN ON THE PLANS THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING. F. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
91	5010-E-1	<u>WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. REFER TO B SHEETS FOR DETAILS FOR INSTALLATION. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. E. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. F. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
92	5010-E-1	<u>WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, SHORT SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. REFER TO B SHEETS FOR DETAILS FOR INSTALLATION. THIS ITEM SHALL BE USED FOR EXTERNAL FIRE SERVICE WITH A TEMPORARY FIRE HYDRANT AT THE END THAT IS ABLE TO BE REMOVED AND UTILIZED AS A SERVICE LINE FOR THE ADJACENT LOT IN CASE OF DEVELOPMENT. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. E. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. F. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
93	5010-E-1	<u>WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, LONG SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. REFER TO B SHEETS FOR DETAILS FOR INSTALLATION. THIS ITEM SHALL BE USED FOR EXTERNAL FIRE SERVICE WITH A TEMPORARY FIRE HYDRANT AT THE END THAT IS ABLE TO BE REMOVED AND UTILIZED AS A SERVICE LINE FOR THE ADJACENT LOT IN CASE OF DEVELOPMENT. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. E. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. F. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.

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94	5010-E-1	<u>WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. REFER TO B SHEETS FOR DETAILS FOR INSTALLATION. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER PRIOR TO INSTALLING FIRE SERVICE TO CONFIRM LOCATION TO STUB INTO THE BUILDING AND PRIOR TO INSTALLING TEE FOR FIRE SERVICE IN THE WATER MAIN. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, TEE CONNECTION TO THE MAIN, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. ITEM INCLUDED CORE DRILLING THROUGH EXISTING FOUNDATION, EXTENDING FIRE SERVICE PIPE THROUGH THE FOUNDATION WALL, WATERTIGHT LINK SEAL INSTALLATION AND ANY OTHER ITEMS NECESSARY FOR STUBBING INTO BASEMENT. E. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. F. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. G. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
95	5010-E-1	<u>WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, LONG SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. REFER TO B SHEETS FOR DETAILS FOR INSTALLATION. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER PRIOR TO INSTALLING FIRE SERVICE TO CONFIRM LOCATION TO STUB INTO THE BUILDING AND PRIOR TO INSTALLING TEE FOR FIRE SERVICE IN THE WATER MAIN. B. ALL WATERMAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, TEE CONNECTION TO THE MAIN, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. ITEM INCLUDED CORE DRILLING THROUGH EXISTING FOUNDATION OR OTHER NECESSARY MEANS AS DETERMINED BY THE CONTRACTOR TO EXTENDING FIRE SERVICE PIPE THROUGH THE FOUNDATION WALL, WATERTIGHT LINK SEAL INSTALLATION AND ANY OTHER ITEMS NECESSARY ITEMS FOR STUBBING INTO BASEMENT AND SEALING PENETRATION. E. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. F. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. G. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
96	5010-E-1	<u>WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, SHORT SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. REFER TO B SHEETS FOR DETAILS FOR INSTALLATION. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER PRIOR TO INSTALLING FIRE SERVICE TO CONFIRM LOCATION TO STUB INTO THE BUILDING AND PRIOR TO INSTALLING TEE FOR FIRE SERVICE IN THE WATER MAIN. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, TEE CONNECTION TO THE MAIN, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. ITEM INCLUDED CORE DRILLING THROUGH EXISTING FOUNDATION OR OTHER NECESSARY MEANS AS DETERMINED BY THE CONTRACTOR TO EXTENDING FIRE SERVICE PIPE THROUGH THE FOUNDATION WALL, WATERTIGHT LINK SEAL INSTALLATION AND ANY OTHER ITEMS NECESSARY ITEMS FOR STUBBING INTO BASEMENT AND SEALING PENETRATION. E. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. F. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. G. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.
97	5010-E-1	<u>WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, LONG SIDE</u> A. REFER TO M SHEETS FOR WATER MAIN LOCATION. REFER TO B SHEETS FOR DETAILS FOR INSTALLATION. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER PRIOR TO INSTALLING FIRE SERVICE TO CONFIRM LOCATION TO STUB INTO THE BUILDING AND PRIOR TO INSTALLING TEE FOR FIRE SERVICE IN THE WATER MAIN. B. ALL WATER MAIN WORK SHALL CONFORM TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. THIS ITEM SHALL INCLUDE TRENCH EXCAVATION, DEWATERING, FURNISHING AND INSTALLING PIPE, FITTINGS, TEE CONNECTION TO THE MAIN, RESTRAINED JOINTS, TRUST BLOCKS, TRACER WIRE SYSTEM, TESTING, DISINFECTION, AND POLYETHYLENE WRAP FOR DUCTILE IRON FITTINGS AND NITRILE GASKETS, REMOVAL AND DISPOSAL OF EXISTING WATER SERVICE PIPE AND MATERIAL. TRACER WIRE SHALL BE TERMINATED AT END OF EACH SERVICE AND GROUNDED. D. ITEM INCLUDED CORE DRILLING THROUGH EXISTING FOUNDATION OR OTHER NECESSARY MEANS AS DETERMINED BY THE CONTRACTOR TO EXTENDING FIRE SERVICE PIPE THROUGH THE FOUNDATION WALL, WATERTIGHT LINK SEAL INSTALLATION AND ANY OTHER ITEMS NECESSARY ITEMS FOR STUBBING INTO BASEMENT AND SEALING PENETRATION. E. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN SERVICE REGARDLESS OF FINAL LENGTH INSTALLED. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR FITTING NECESSARY ON SERVICE TO CONNECT TO EXISTING SERVICE OR ADJUSTMENT TO AVOID CONFLICTS WITH EXISTING UTILITIES. F. ALL PIPE MATERIAL SHALL BE A MINIMUM OF AWWA CLASS 350 DUCTILE IRON PIPE WITH POLYETHYLENE ENCASEMENT AND NITRILE GASKETS. G. WATER SHUTDOWNS SHALL REQUIRE THE FOLLOWING. MARSHALLTOWN WATER WORKS SHALL BE NOTIFIED 48 HOURS PRIOR TO ANY SHUTDOWN. MARSHALLTOWN WATER WORKS SHALL OPERATE ALL EXISTING VALVES. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. A MINIMUM OF 24 HOURS NOTICE SHALL BE GIVEN TO THE AFFECTED PROPERTIES INCLUDING DOOR TO DOOR COMMUNICATION AND DOOR KNOCKERS LEFT BEHIND. A MAXIMUM OF AN 8 CONTINUOUS HOUR SHUTDOWN IS ALLOWED FOR ANY SINGLE PROPERTY WHEN MAKING SIDE STREET CONNECTION. A MAXIMUM OF 2 HOURS OF SHUTDOWN FOR ANY SINGLE BUILDING WILL BE ALLOWED WHEN SWITCHING A SERVICE TO THE NEW WATER MAIN.

98	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 3/4 INCH, SHORT SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATER MAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
99	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 3/4 INCH, LONG SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
100	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 1 INCH, SHORT SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
101	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 1 INCH, LONG SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
102	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 1 1/4 INCH, SHORT SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
103	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 1 1/4 INCH, LONG SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
104	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 1 1/2 INCH, SHORT SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
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CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

ESTIMATE REFERENCE NOTES

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106	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 1 3/4 INCH, SHORT SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
107	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 1 3/4 INCH, LONG SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
108	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 2 INCH, SHORT SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
109	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 2 INCH, LONG SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
110	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 2 1/2 INCH, SHORT SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ALL SERVICES SHALL HAVE TRACER WIRE REGARDLESS OF MATERIAL. TRACER WIRE SHALL BE CLAMPED TO SERVICE WITH A GROUND ROD INSTALLED C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE SHORT SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
111	5010-E-1	<u>WATER SERVICE PIPE, COPPER, 2 1/2 INCH, LONG SIDE</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION FOR MARSHALLTOWN WATER WORKS SPECIFICATIONS. REFER TO TABULATIONS FOR ANTICIPATED SCHEDULE OF SERVICES. B. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN, AND CONNECTION TO NEW CURB STOP AND CONNECTION TO EXISTING SERVICE. CURB STOP WILL BE PAID FOR UNDER A SEPARATE BID ITEM. REMOVAL OF EXISTING SERVICE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. C. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER FOR SERVICE INTERRUPTION TO SWITCH WATER SERVICE. A MINIMUM OF 48 HOURS OF NOTICE IS REQUIRED FOR WATER SHUTOFFS. D. QUANTITY IS ESTIMATED TO ESTABLISH A UNIT PRICE FOR INSTALLATION ON THE LONG SIDE OF THE WATERMAIN REGARDLESS OF FINAL LENGTH INSTALLED, ONLY QUANTITY APPROVED WILL BE PAID.
112	5010-E-3	<u>WATER SERVICE CURB STOP AND BOX</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR WATER SERVICES FOR MORE INFORMATION. B. A. ITEM SHALL INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT TO INSTALL CURB STOP AND BOX. PAYMENT SHALL INCLUDE CONNECTION TO EXISTING SERVICE, REGARDLESS OF SIZE. ALL CURB STOPS IN PAVEMENT SHALL HAVE A PVC SLEEVE INSTALLED IN THE PAVEMENT AROUND THE CURB STOP. C. CONTRACTOR SHALL NOTIFY ENGINEER IF LEAD OR GALVANIZED SERVICES ARE FOUND.
113	5010-H	<u>WATER MAIN REMOVAL</u> A. THIS ITEMS SHALL INCLUDE THE REMOVAL AND DISPOSAL OF ALL EXISTING WATERMAIN PIPE INSIDE THE PROJECT LIMITS. ITEM SHALL INCLUDE THE REMOVAL OF PIPE AND LINE STOPS. B. EXISTING PIPE SHALL NOT BE REMOVED UNTIL NEW WATERMAIN IS INSTALLED. C. EXISTING SERVICE PIPE REMOVAL AND DISPOSAL SHALL BE INCIDENTAL TO THIS ITEM.
114	5020-A	<u>VALVE, GATE, 4 INCH, FIRE SERVICE</u> A. THIS ITEM SHALL INCLUDE ALL COMPONENTS ATTACHED TO THE VALVE OR REQUIRED FOR ITS COMPLETE INSTALLATION, INCLUDING UNDERGROUND OR ABOVE GROUND OPERATOR, SQUARE VALVE OPERATION NUT, VALVE BOX AND COVER, VALVE BOX EXTENSION, AND VALVE STEM EXTENSION. B. THIS ITEM SHALL BE INSTALLED IN ACCORDANCE TO MARSHALLTOWN WATER WORKS SPECIFICATIONS
115	5020-A	<u>VALVE, GATE, 6 INCH, FIRE SERVICE</u> A. THIS ITEM SHALL INCLUDE ALL COMPONENTS ATTACHED TO THE VALVE OR REQUIRED FOR ITS COMPLETE INSTALLATION, INCLUDING UNDERGROUND OR ABOVE GROUND OPERATOR, SQUARE VALVE OPERATION NUT, VALVE BOX AND COVER, VALVE BOX EXTENSION, AND VALVE STEM EXTENSION. B. THIS ITEM SHALL BE INSTALLED IN ACCORDANCE TO MARSHALLTOWN WATER WORKS SPECIFICATIONS

116	5020-A	<u>VALVE, GATE, 8 INCH</u> A. THIS ITEM SHALL INCLUDE ALL COMPONENTS ATTACHED TO THE VALVE OR REQUIRED FOR ITS COMPLETE INSTALLATION, INCLUDING UNDERGROUND OR ABOVE GROUND OPERATOR, SQUARE VALVE OPERATION NUT, VALVE BOX AND COVER, VALVE BOX EXTENSION, AND VALVE STEM EXTENSION. B. THIS ITEM SHALL BE INSTALLED IN ACCORDANCE TO MARSHALLTOWN WATER WORKS SPECIFICATIONS
117	5020-A	<u>INSERTION VALVE, 6 INCH</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ALL INSERTION VALVE REQUIREMENTS
118	5020-A	<u>INSERTION VALVE, 8 INCH</u> A. REFER TO SUPPLEMENTAL SPECIFICATION FOR ALL INSERTION VALVE REQUIREMENTS
119	5020-A	<u>LINE STOP, 8 INCH</u> A. ITEMS ALLOWS THE ISOLATION OF WATER MAIN WITHOUT INTERRUPTING WATER SERVICE TO EXISTING BUILDINGS. B. LINE STOP MUST FOLLOW ALL AWWA STANDARDS.
120	5020-A	<u>LINE STOP, 10 INCH</u> A. ITEMS ALLOWS THE ISOLATION OF WATER MAIN WITHOUT INTERRUPTING WATER SERVICE TO EXISTING BUILDINGS. B. LINE STOP MUST FOLLOW ALL AWWA STANDARDS.
121	5020-C	<u>FIRE HYDRANT ASSEMBLY</u> A. THIS ITEM INCLUDES ALL LABOR AND MATERIAL FOR EXCAVATION, HAULING OFF EXCAVATED SOIL AND MATERIALS TO AN APPROVED LOCATION, BACKFILL, COMPACTION OF BACKFILL, AND INSTALLATION OF FIRE HYDRANT ASSEMBLY INCLUDING THE HYDRANT, VALVE, PIPING, PIPE RESTRAINTS AND CONNECTION TO PIPE. THIS ITEM INCLUDES THE HYDRANT TEE. B.THIS ITEM SHALL BE INSTALLED IN ACCORDANCE TO MARSHALLTOWN WATER WORKS SPECIFICATIONS. C. HYDRANT SHALL HAVE TRACER WIRE STATION FOR EACH HYDRANT
122	5020-E	<u>FLUSHING DEVICE (TEMPORARY BLOWOFF DEVICE)</u> A. THIS ITEMS SHALL BE FOR THE INSTALLATION OF A TEMPORARY BLOWOFF HYDRANT FOR USE DURING CONSTRUCTION B. THIS ITEM INCLUDES ALL LABOR AND MATERIAL FOR EXCAVATION, HAULING OFF EXCAVATED SOIL AND MATERIALS TO AN APPROVED LOCATION, BACKFILL, COMPACTION OF BACKFILL, AND INSTALLATION OF TEMPORARY BLOWOFF HYDRANT ASSEMBLY INCLUDING THE HYDRANT, VALVE, PIPING, PIPE RESTRAINTS, CONNECTION TO PIPE AND REMOVAL OF BLOW OFF HYDRANT. THIS ITEM INCLUDES THE HYDRANT TEE, ANY LENGTH OF PIPES NEEDED FOR TEMPORARY PLACEMENT AND REMOVAL OF FLUSHING DEVICE. C. THIS ITEM SHALL BE INSTALLED IN ACCORDANCE TO MARSHALLTOWN WATER WORKS SPECIFICATIONS..
123	5020-J	<u>FIRE HYDRANT ASSEMBLY REMOVAL</u> A. THIS ITEM SHALL INCLUDE ALL EQUIPMENT, LABOR AND MATERIALS NECESSARY TO REMOVE EXISTING, PIPE, FITTINGS, AND HYDRANT BACK TO THE MAIN. B. CONTRACTOR SHALL COORDINATE WITH MWW INSPECTION STAFF FOR SALVAGING REMOVED HYDRANTS, ANY HYDRANTS NOT SALVAGED TO MWW SHALL BE DISPOSED OF PROPERLY.
124	5020-K	<u>VALVE REMOVAL</u> A. THIS ITEM SHALL INCLUDE ALL EQUIPMENT, LABOR AND MATERIALS NECESSARY TO REMOVE EXISTING VALVE BOX INCLUDING EXCAVATION, DISPOSAL OF VALVE BOX BACKFILL AND COMPACTION OF SURROUNDING AREA.
125	6010-A	<u>STORM MANHOLE, SW-401, 48 INCH</u> A. REFER TO M SHEETS FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "STORM SEWER" AND BE SW-602 TYPE E. C. BOXOUTS SHALL BE CIRCULAR BOXOUTS
126	6010-A	<u>STORM MANHOLE, SW-401, 84 INCH</u> A. REFER TO M SHEETS FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "STORM SEWER" AND BE SW-602 TYPE E. C. BOXOUTS SHALL BE CIRCULAR BOXOUTS
127	6010-B	<u>INTAKE, SW-501</u> A. REFER TO M1 SHEETS FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "NO DUMP, DRAINS TO WATERWAY". CASTING SHALL BE SW-603 TYPE R OR Q DEPENDING ON LOCATION. C. INTAKE SHALL BE EITHER CAST-IN-PLACE OR PRECAST. IF THE STRUCTURE IS NOT ABLE TO BE PRECAST THEN IT SHALL BE CAST-IN-PLACE WITH NO ADDITIONAL PAYMENT.
128	6010-B	<u>INTAKE, SW-503</u> A. REFER TO M1 SHEETS FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "NO DUMP, DRAINS TO WATERWAY". CASTING SHALL BE SW-603 TYPE R OR Q DEPENDING ON LOCATION. C. INTAKE SHALL BE EITHER CAST-IN-PLACE OR PRECAST. IF THE STRUCTURE IS NOT ABLE TO BE PRECAST THEN IT SHALL BE CAST-IN-PLACE WITH NO ADDITIONAL PAYMENT.
129	6010-B	<u>INTAKE, SW-505</u> A. REFER TO M1 SHEETS FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "NO DUMP, DRAINS TO WATERWAY". CASTING SHALL BE SW-603 TYPE R OR Q DEPENDING ON LOCATION. C. INTAKE SHALL BE EITHER CAST-IN-PLACE OR PRECAST. IF THE STRUCTURE IS NOT ABLE TO BE PRECAST THEN IT SHALL BE CAST-IN-PLACE WITH NO ADDITIONAL PAYMENT.
130	6010-B	<u>INTAKE, SW-506</u> A. REFER TO M1 SHEETS FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "NO DUMP, DRAINS TO WATERWAY". CASTING SHALL BE SW-603 TYPE R OR Q DEPENDING ON LOCATION. C. INTAKE SHALL BE EITHER CAST-IN-PLACE OR PRECAST. IF THE STRUCTURE IS NOT ABLE TO BE PRECAST THEN IT SHALL BE CAST-IN-PLACE WITH NO ADDITIONAL PAYMENT. D. CONTRACTOR SHALL WIDEN WALL 1 AS NEEDED TO ACCOMMODATE A 36" RCP PIPE. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR WIDENING THE STRUCTURE TO FIT A 36" PIPE.
131	6010-B	<u>INTAKE, SW-507</u> A. REFER TO M1 SHEETS FOR STORM SEWER LOCATION AND PROFILES B. MANHOLE CASTINGS SHALL READ "NO DUMP, DRAINS TO WATERWAY". C. INTAKE SHALL BE EITHER CAST-IN-PLACE OR PRECAST. IF THE STRUCTURE IS NOT ABLE TO BE PRECAST THEN IT SHALL BE CAST-IN-PLACE WITH NO ADDITIONAL PAYMENT.
132	6010-B	<u>INTAKE, SW-541, MODIFIED</u> A. REFER TO M1 SHEETS FOR STORM SEWER LOCATION AND PROFILES. REFER TO B SHEETS FOR DETAILS B. MANHOLE CASTINGS SHALL READ "NO DUMP, DRAINS TO WATERWAY". C. INTAKE SHALL BE EITHER CAST-IN-PLACE OR PRECAST. IF THE STRUCTURE IS NOT ABLE TO BE PRECAST THEN IT SHALL BE CAST-IN-PLACE WITH NO ADDITIONAL PAYMENT.
133	6010-F	<u>MANHOLE ADJUSTMENT, MINOR</u> A. REFER TO D SHEETS FOR LOCATION. THIS BID ITEM SHALL INCLUDE ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO ADJUST CASTINGS TO FINISHED GRADE. THIS ITEM INCLUDES THE REMOVAL AND REPLACEMENT OF ADJUSTMENT RINGS AND THE INSTALLATION OF NEW CASTINGS. B. FURNISH NEW 3 PIECE CASTING. ITEM ALSO INCLUDES SAW CUTTING AND REMOVING PAVEMENT FULL DEPTH FOR PCC BOXOUT PER SECTION 7010, FIGURE 7010.103 OR 7020, FIGURE 7020.201. CONSTRUCT PCC BOXOUT WITH CLASS C OR CLASS M CONCRETE. ADDITIONAL TRAFFIC CONTROL AND LOCATING OF THE MANHOLES IS CONSIDERED INCIDENTAL TO THIS ITEM.



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DESIGNED	DEM	REV	DESCRIPTION	DATE
DRAWN	DEM	A	90% PROGRESS PLANS	12/20/2024
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CLIENT PROJ. NO.	0A1.129221			

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

ESTIMATE REFERENCE NOTES

SHEET

C.09

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134	6010-G	<u>CONNECTION TO EXISTING MANHOLE</u> A. THIS ITEM SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIALS NECESSARY TO CONNECT TO EXISTING STORM SEWER MANHOLE. B. THIS ITEM SHALL NOT BE USED WHEN CONNECTING TO EXISTING PIPE STUBBED OUT OF MANHOLE. C. THIS ITEM SHALL INCLUDE REMOVAL OF EXISTING INVERT AND REPOURING INVERT IF NECESSARY BASED ON FLOWLINES OF CONNECTED PIPES.
135	6010-H	<u>REMOVE MANHOLE</u> A. REFER TO F SHEETS FOR LOCATIONS B. THIS BID ITEM SHALL INCLUDE ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO REMOVE ALL COMPONENTS OF THE EXISTING STRUCTURE AND LEGALLY DISPOSING AT AN OFF SITE LOCATION.
136	6010-H	<u>REMOVE INTAKE</u> A. REFER TO F SHEETS FOR LOCATIONS B. THIS BID ITEM SHALL INCLUDE ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO REMOVE ALL COMPONENTS OF THE EXISTING STRUCTURE AND LEGALLY DISPOSING AT AN OFF SITE LOCATION.
137	7010-A	<u>PAVEMENT, PCC, 8 INCH, C4WRC20</u> A. REFER TO B SHEETS FOR TYPICAL SECTIONS AND D AND E SHEETS FOR STREET PLAN AND PROFILES. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT WILL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED FOR ANY WORK ON THE PROJECT. B. ALL JOINTS SHALL BE SAW CUT TO A DEPTH OF T/3 AND SEALED. CONTRACTOR SHALL MEET SMOOTHNESS REQUIREMENTS FOR LOCAL STREETS AND COLLECTORS. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. C. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. THICKENED EDGES SHALL BE INCIDENTAL TO THIS BID ITEM, NO ADDITIONAL PAYMENT SHALL BE MADE. D. CONCRETE TESTING WILL BE PROVIDED BY THE CONTRACTOR. E. REFER TO L SHEETS FOR JOINTING DETAILS. PAVING SHALL BE COMPLETED WITH A SLIPFORM PAVER OR LASER SCREED. F. ADJUSTMENT OF CURB BOXES TO FG THAT FALL WITHIN THE PAVEMENT AREA SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM.
138	7010-F	<u>PLANTER CURB</u> A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL PCC PLANTER CURBS. SEE K SHEETS FOR LOCATIONS AND B SHEETS FOR DETAILS. B. ITEM SHALL INCLUDE ALL REINFORCING, COMPACTED AGGREGATE BASE AND SAW-CUT RELIEF JOINTS AS INCIDENTAL TO THE BID ITEM. C. ITEM IS TO BE PAID ON A LINEAR FOOT BASIS FOR ALL PLANTER CURB INSTALLED. D. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT WILL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED FOR ANY WORK ON THE PROJECT. E. CONCRETE TESTING WILL BE PROVIDED BY THE CONTRACTOR.
139	7010-I	<u>PCC PAVEMENT SAMPLES AND TESTING</u> A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED CONCRETE TESTING PER IDOT AND SUDAS SECTION 7030.3.11. B. THIS ITEM SHALL INCLUDE TESTING FOR ROADWAY PAVEMENT PLANTER CURBS, VARIABLE WIDTH CONCRETE BANDS, FOUNDATIONS, RAMPS AND STAIRS
140	7030-A-1	<u>REMOVAL OF SIDEWALK</u> A. THE THICKNESS OF THE EXISTING PAVEMENT IS VARIABLE. FULL DEPTH SAW CUTS SHALL BE INCIDENTAL TO THIS ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL REMOVAL, EARTHWORK, SUBGRADE PREPARATION, MODIFIED SUBBASE AND PAVING EXPENSES DUE TO DAMAGED EDGES. ADDITIONAL REMOVAL TO BE DETERMINED BY ENGINEER. PAYMENT SHALL BE MADE FOR THE AREA OF SIDEWALK REMOVED, REGARDLESS OF THICKNESS. B. THIS ITEM SHALL INCLUDE ALL LABOR AND EQUIPMENT NECESSARY TO REMOVE ALL SIDEWALK PAVING AND EARTHWORK NEEDED TO MAKE THE PROPOSED IMPROVEMENTS. REFER TO F SHEETS FOR REMOVAL LIMITS. C. CONTRACTOR SHALL SUBMIT PROPOSED REMOVAL EQUIPMENT TO ENGINEER FOR APPROVAL PRIOR TO ANY REMOVALS. EQUIPMENT SHALL NOT CAUSE ANY DAMAGE TO EXISTING BUILDINGS INCLUDING FOOTING, FOUNDATION WALLS, WALLS, WINDOWS, GLASS OR OTHER DECORATIONS.
141	7030-A-3	<u>REMOVAL OF DRIVEWAY</u> A. THE THICKNESS OF THE EXISTING PAVEMENT IS VARIABLE. FULL DEPTH SAW CUTS SHALL BE INCIDENTAL TO THIS ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL REMOVAL, EARTHWORK, SUBGRADE PREPARATION, MODIFIED SUBBASE AND PAVING EXPENSES DUE TO DAMAGED EDGES. ADDITIONAL REMOVAL TO BE DETERMINED BY ENGINEER. PAYMENT SHALL BE MADE FOR THE AREA OF DRIVEWAY REMOVED, REGARDLESS OF THICKNESS. B. THIS ITEM SHALL INCLUDE ALL LABOR AND EQUIPMENT NECESSARY TO REMOVE ALL DRIVEWAY PAVING AND EARTHWORK NEEDED TO MAKE THE PROPOSED IMPROVEMENTS. REFER TO R SHEETS FOR REMOVAL LIMITS AND SHEET C.11 FOR TABULATIONS. C. CONTRACTOR SHALL SUBMIT PROPOSED REMOVAL EQUIPMENT TO ENGINEER FOR APPROVAL PRIOR TO ANY REMOVALS. EQUIPMENT SHALL NOT CAUSE ANY DAMAGE TO EXISTING BUILDINGS INCLUDING FOOTING, FOUNDATION WALLS, WALLS, WINDOWS, GLASS OR OTHER DECORATIONS.
142	7030-E	<u>SIDEWALK, PCC, 5 INCH</u> A. CONCRETE SHALL BE A C-4 MIX WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI. M MIX CAN BE UTILIZED WHERE NEEDED TO REDUCE BUSINESS DOWNTIME. NO ADDITIONAL PAYMENT WILL BE PROVIDED WHEN M MIX IS USED. B. AREAS NOT MEETING THIS REQUIREMENT SHALL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. C. COLD WEATHER CONCRETE WILL BE CONSIDERED INCIDENTAL IF REQUIRED. D. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. E. VARIATIONS IN THICKNESS AND WIDTH AND NECESSARY REBAR SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. REFER TO K SHEETS FOR LOCATIONS AND B SHEET SERIES FOR INSTALLATION DETAILS. F. CONCRETE TESTING SHALL BE PROVIDED BY THE CONTRACTOR
143	7030-E	<u>SIDEWALK, PCC, 6 INCH</u> A. CONCRETE SHALL BE A C-4 MIX WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI. B. AREAS NOT MEETING THIS REQUIREMENT SHALL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. C. COLD WEATHER CONCRETE WILL BE CONSIDERED INCIDENTAL IF REQUIRED. D. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. E. VARIATIONS IN THICKNESS AND WIDTH AND NECESSARY REBAR SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. REFER TO K SHEETS FOR LOCATIONS AND B SHEET SERIES FOR INSTALLATION DETAILS. F. CONCRETE TESTING SHALL BE PROVIDED BY THE CONTRACTOR
144	7030-F	<u>CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE</u> A. THIS ITEM INCLUDES THE 8 CM THICK CROSSWALK CONCRETE UNIT PAVERS, POLYMERIC SAND FOR JOINTS, BITUMINOUS SETTING BED, NEOPRENE MASTIC, 6 INCH THICK CONCRETE BASE, REBAR, WEEP HOLES AND SUBGRADE PREP. B. REFER TO K SHEETS FOR TYPE, LOCATION, FINISH, AND COLOR. REFER TO B SHEETS FOR INSTALLATION DETAILS. C. SEE SPECIFICATION SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

145	7030-F	<u>ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE</u> A. THIS ITEM INCLUDES THE 8 CM THICK ROADWAY CONCRETE UNIT PAVERS, POLYMERIC SAND FOR JOINTS, BITUMINOUS SETTING BED, NEOPRENE MASTIC, 6 INCH THICK CONCRETE BASE, REBAR, WEEP HOLES AND SUBGRADE PREP. B. REFER TO K SHEETS FOR TYPE, LOCATION, FINISH, AND COLOR. REFER TO B SHEETS FOR INSTALLATION DETAILS. C. SEE SPECIFICATION SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
146	7030-F	<u>SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE</u> A. THIS ITEM INCLUDES SIDEWALK UNIT PAVERS PATTERN 'A' AND PATTERN 'B' WITH PCC BASE, POLYMERIC SAND FOR JOINTS, SAND SETTING BED, GEOTEXTILE FABRIC, 4 INCH THICK CONCRETE BASE, REBAR, AGGREGATE SUBBASE, WEEP HOLES AND SUBGRADE PREP. B. REFER TO K SHEETS FOR TYPE, LOCATION, FINISH, AND COLOR. REFER TO B SHEETS FOR INSTALLATION DETAILS AND PATTERNS. C. SEE SPECIFICATION SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.
147	7030-G	<u>DETECTABLE WARNING</u> A. REFER TO S SHEETS FOR LOCATIONS. DETECTABLE WARNINGS SHALL BE CAST IRON. REFER TO MARSHALLTOWN SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL DETAILS.
148	7030-H-1	<u>DRIVEWAY, PAVED, PCC, 7 INCH</u> A. REFER TO D SHEETS FOR LAYOUT. ALL JOINTS SHALL BE CUT TO A DEPTH OF T/3 AND SEALED. B. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT SHALL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. CERTIFIED PLANT INSPECTION SHALL BE REQUIRED BY CONTRACTOR. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. C. QUANTITY FOR DRIVEWAY INCLUDES AN ADDITIONAL 10% OVER TABULATION TO ALLOW FOR UP TO 2 FEET OF DRIVEWAY REPLACEMENT BEYOND LIMITS SHOWN IN THE PLANS. THE ADDITIONAL 2 FEET SHALL ONLY BE UTILIZED BASED ON EXISTING DRIVEWAY CONDITION AND UPON APPROVAL OF THE ENGINEER
149	7030-H-1	<u>DRIVEWAY, PAVED, PCC, 8 INCH (ALLEY)</u> A. REFER TO D SHEETS FOR LAYOUT. ALL JOINTS SHALL BE CUT TO A DEPTH OF T/3 AND SEALED. B. ALL CONCRETE SHALL BE CLASS C AND MEET MINIMUM COMPRESSIVE STRENGTH REQUIREMENT OF 4,000 PSI AT 28 DAYS. AREAS NOT MEETING THIS REQUIREMENT SHALL BE SUBJECT TO REPAIRS, REPLACEMENT OR REDUCED PAYMENT AS DETERMINED BY THE ENGINEER AND TEST RESULTS WILL REPRESENT ALL CONCRETE PLACED IN THE SAME LOT. CERTIFIED PLANT INSPECTION SHALL BE REQUIRED BY CONTRACTOR. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. CRACKED PANELS SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE UNLESS, IN THE JUDGMENT OF THE ENGINEER, THE CRACK CAN BE ROUTED AND SEALED. C. QUANTITY FOR DRIVEWAY INCLUDES AN ADDITIONAL 10% OVER TABULATION TO ALLOW FOR UP TO 2 FEET OF DRIVEWAY REPLACEMENT BEYOND LIMITS SHOWN IN THE PLANS. THE ADDITIONAL 2 FEET SHALL ONLY BE UTILIZED BASED ON EXISTING DRIVEWAY CONDITION AND UPON APPROVAL OF THE ENGINEER
150	7030-I-1	<u>SIDEWALK ASSURANCE TESTING</u> A. CONTRACTOR SHALL PROVIDE ALL MATERIAL TESTING REQUIRED FOR SIDEWALK PAVEMENT PER SUDAS SECTION 7030.3.11. B. CONTRACTOR SHALL TEST ALL MATERIAL REGARDLESS OF SINGLE DAY POUR VOLUME.
151	7030-I-3	<u>DRIVEWAY ASSURANCE TESTING</u> A. CONTRACTOR SHALL PROVIDE ALL MATERIAL TESTING REQUIRED FOR DRIVEWAY PAVEMENT PER SUDAS SECTION 7030.3.11. B. CONTRACTOR SHALL TEST ALL MATERIAL REGARDLESS OF SINGLE DAY POUR VOLUME.
152	7040-H	<u>PAVEMENT REMOVAL</u> A. ALL REMOVALS TO BE MARKED AND MEASURED BY THE ENGINEER. FULL DEPTH SAW CUTS ALONG THE REMOVAL LIMITS ARE INCIDENTAL TO THIS ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL REMOVAL, EARTHWORK, SUBGRADE PREPARATION, MODIFIED SUBBASE AND PAVING EXPENSES DUE TO DAMAGED EDGES. ADDITIONAL REMOVAL TO BE DETERMINED BY ENGINEER. PAYMENT SHALL BE MADE FOR THE AREA OF PAVEMENT REMOVED, REGARDLESS OF THICKNESS. CONTRACTOR SHALL LEGALLY DISPOSE OF ALL MATERIALS AT AN OFF-SITE WASTE AREA. B. THIS ITEMS INCLUDES REMOVAL AND DISPOSAL OF ANY BRICK LOCATED UNDER THE EXISTING ROADWAY. C. MEMORIAL PAVERS IN THE INTERSECTION OF MAIN STREET AND CENTER STREET SHALL BE SALVAGED TO THE CITY OF MARSHALLTOWN. THIS SHALL BE INCIDENTAL TO PAVEMENT REMOVAL. PAVERS SHALL BE PALLETIZED AND DELIVERED TO PUBLIC WORKS.
153	8020-B	<u>PAINTED PAVEMENT MARKINGS, SOLVENT/WATERBORNE</u> A. REFER TO C SHEETS FOR TABULATIONS AND N SHEETS FOR LOCATIONS. B. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC), CHAPTER 130. C. REMOVAL OF EXISTING PAVEMENT MARKING IN PUBLIC PARKING LOT N SHALL BE INCIDENTAL TO THIS ITEM.
154	8020-G	<u>PAINTED SYMBOLS AND LEGENDS</u> A. REFER TO C SHEETS FOR TABULATIONS AND N SHEETS FOR LOCATIONS. B. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC), CHAPTER 130.
155	8030-A	<u>TEMPORARY TRAFFIC CONTROL</u> A. THIS ITEM SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO INSTALL, MAINTAIN, AND REMOVE TEMPORARY TRAFFIC CONTROL AS NEEDED THROUGHOUT THE PROJECT DURATION. TEMPORARY TRAFFIC CONTROL SIGNS INSTALLED FOR MORE THAN 1 WEEK SHALL BE POST MOUNTED. PAYMENT SHALL BE LUMP SUM, REGARDLESS OF THE NUMBER OF MOBILIZATIONS TO THE SITE. B. REFER TO J SHEETS FOR STAGING AND TRAFFIC CONTROL NOTES. C. ALL ROADWAY CLOSURES SHALL BE INCLUDED IN THIS ITEM D. THIS ITEMS INCLUDES ANY REQUIRED PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS), TEMPORARY PAVEMENT MARKING, REMOVAL OF TEMPORARY PAVEMENT MARKING AND ANY NECESSARY TEMPORARY PAVEMENT REQUIRED BETWEEN PHASES OVER THE WINTER.
156	8030-A	<u>TEMPORARY TRAFFIC CONTROL - PEDESTRIAN ACCESS</u> A. THIS ITEM SHALL INCLUDE ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO INSTALL, MAINTAIN, AND REMOVE TEMPORARY PEDESTRIAN TRAFFIC CONTROL AS NEEDED THROUGHOUT THE PROJECT DURATION. PAYMENT SHALL BE LUMP SUM, REGARDLESS OF THE NUMBER OF MOBILIZATIONS TO THE SITE. B. THIS ITEM SHALL INCLUDE THE INSTALLATION AND MAINTENANCE OF TEMPORARY PEDESTRIAN SCALE LIGHTING DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE LIGHTING ADJACENT TO ANY OPEN PEDESTRIAN PATHS TO ENSURE AT LEAST 0.5 FOOT CANDLE OF LIGHTING IS PROVIDED ON PEDESTRIAN PATHS DURING CONSTRUCTION. C. ALL PEDESTRIAN CLOSURES AND ANY REQUIRED TEMPORARY PEDESTRIAN WALKWAYS FOR ACCESS TO FRONT DOORS SHALL BE INCLUDED IN THIS ITEM. D. THE CITY, IN CONJUNCTION WITH THE CHAMBER, MCB, AND BUSINESSES, WILL BE INSTALLING BUSINESS SPECIFIC SIGNAGE TO AID IN DIRECTING PATRONS TO BUSINESSES THROUGHOUT CONSTRUCTION. THESE SIGNS WILL NOT INTERFERE OR CONFLICT WITH TEMPORARY TRAFFIC CONTROL SUPPLIED BY THE CONTRACTOR. IT IS THE CITY'S INTENT THAT THESE ARE UPDATED DAILY BY A CITY REPRESENTATIVE; HOWEVER, COORDINATION ON TIMING INFORMATION AND IMPACTS TO BUSINESS ACCESS WILL BE NEEDED FROM THE CONTRACTOR. THE CONTRACTOR SHALL COMMUNICATE DAILY WITH AN ON-SITE REPRESENTATIVE TO CONFIRM BUSINESS ACCESS SO SIGNAGE UPDATES CAN BE MADE AND INFORMATION TO BUSINESS OWNERS CAN BE RELAYED.



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DESIGNED	DEM	REV	DESCRIPTION	DATE
DRAWN	DEM	A	90% PROGRESS PLANS	12/20/2024
CHECKED	GAB			
CLIENT PROJ. NO.	0A1.129221			

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

ESTIMATE REFERENCE NOTES

SHEET

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157	8040-J	<u>REMOVE AND SALVAGE TRAFFIC SIGN ASSEMBLY</u> A. THIS ITEM INCLUDES THE REMOVAL OF EXISTING CITY OWNED STREET SIGNS AND POSTS. EXISTING SIGNS SHALL BE SALVAGED TO THE CITY. THIS BID ITEM INCLUDES REMOVAL OF THE EXISTING SIGNS, POLES AND SALVAGED TO THE CITY, DELIVERED TO THE MARSHALLTOWN PUBLIC WORKS BUILDING B. THIS ITEM TO BE MEASURED BY EACH SIGN REMOVED. C. PAYMENT FOR THIS ITEM SHALL BE AT THE CONTRACT UNIT PRICE PER EACH SIGN REMOVED. THIS PAYMENT SHALL BE CONSIDERED FULL COMPENSATION FOR ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED TO REMOVE EACH SIGN.
158	9020-A	<u>SOD</u> A. INCLUDES SODDING OF AREA INDICATED ON R SHEETS - EROSION CONTROL PLAN. B. WATERING SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ROCK PICKING, FINISH GRADING, RESODDING AS DIRECTED BY THE ENGINEER ARE CONSIDERED INCIDENTAL TO THIS ITEM. NO ADDITIONAL PAYMENT WILL BE MADE FOR RESODDED AREAS. C. THE CONTRACTOR IS RESPONSIBLE FOR MOWING AND MAINTAINING SEEDED AREAS UNTIL THE PROJECT IS ACCEPTED BY THE OWNER. SODDING OF AREAS DISTURBED OUTSIDE OF THE CONSTRUCTION LIMITS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
159	9030-B	<u>PLANTS WITH WARRANTY, DECIDUOUS SHRUB, (#5 CONT)</u> A. THIS ITEM INCLUDES LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL DECIDUOUS SHRUB (#5 CONT) IN ACCORDANCE WITH SUDAS SECTION 9030 AND AMENDED AS FOLLOWS: PLANTINGS SHALL HAVE ONE YEAR WARRANTY FROM DATE OF FINAL ACCEPTANCE FOR ALL PLANTINGS IN THE PROJECT. B. ACCEPTANCE OF PLANT MATERIALS CONSTRUES FULL PAYMENT (MINUS ANY PROJECT RETAINAGE). C. INCLUDES ALL, BUT NOT LIMITED TO, EXCAVATION, INSTALLATION, HERBICIDE, MAINTENANCE AND WATERING DURING WARRANTY; AND REPLACEMENTS AS REQUIRED. D. SEE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION.
160	9030-B	<u>PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL)</u> A. THIS ITEM INCLUDES LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL PERENNIAL GROUND COVER (1 GAL) IN ACCORDANCE WITH SUDAS SECTION 9030 AND AMENDED AS FOLLOWS: PLANTINGS SHALL HAVE ONE YEAR WARRANTY FROM DATE OF FINAL ACCEPTANCE FOR ALL PLANTINGS IN THE PROJECT. B. ACCEPTANCE OF PLANT MATERIALS CONSTRUES FULL PAYMENT (MINUS ANY PROJECT RETAINAGE). C. INCLUDES ALL, BUT NOT LIMITED TO, EXCAVATION, INSTALLATION, HERBICIDE, MAINTENANCE AND WATERING DURING WARRANTY; AND REPLACEMENTS AS REQUIRED. D. SEE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION.
161	9030-B	<u>PLANTS WITH WARRANTY, DECIDUOUS TREE</u> A. THIS ITEM INCLUDES LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL DECIDUOUS TREE IN ACCORDANCE WITH SUDAS SECTION 9030 AND AMENDED AS FOLLOWS: PLANTINGS SHALL HAVE ONE YEAR WARRANTY FROM DATE OF FINAL ACCEPTANCE FOR ALL PLANTINGS IN THE PROJECT. B. ACCEPTANCE OF PLANT MATERIALS CONSTRUES FULL PAYMENT (MINUS ANY PROJECT RETAINAGE). C. INCLUDES ALL, BUT NOT LIMITED TO, EXCAVATION, INSTALLATION, STAKING, HERBICIDE, MAINTENANCE AND WATERING DURING WARRANTY; AND REPLACEMENTS AS REQUIRED. D. SEE SUPPLEMENTAL SPECIFICATION FOR ADDITIONAL INFORMATION.
162	9030-999-A	<u>RUBBER MULCH</u> A. INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL RUBBER MULCH IN LANDSCAPE BEDS WHERE INDICATED ON K SHEETS. REFER TO SHEET K.00 AND B SERIES FOR DETAIL. C. EXCAVATION AND DISPOSAL OF EXCAVATED MATERIAL, FURNISH AND PLACEMENT OF 5 OZ., WOVEN, COMMERCIAL GRADE LANDSCAPE FABRIC IS CONSIDERED INCIDENTAL. D. ITEM SHALL BE MEASURED AND PAID BY THE CY OF INSTALLED RUBBER MULCH.
163	9030-999-B	<u>IRRIGATION SYSTEM</u> A. ITEM INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE DESIGN AND INSTALLATION OF THE IRRIGATION SYSTEM AS INDICATED ON THE I SHEETS. B. INCLUDES ALL ITEMS NECESSARY TO PROVIDE A FULLY FUNCTIONAL IRRIGATION SYSTEM IN THE AREAS INDICATED ON THE PLANS. C. REFER TO SUPPLEMENTAL SPECIFICATIONS FOR ADDITIONAL INFORMATION. D. ITEM SHALL BE MEASURED AND PAID AS A LUMP SUM FOR THE COMPLETE INSTALLED AND FUNCTIONING IRRIGATION SYSTEM.
164	9040-A-1	<u>SWPPP PREPARATION</u> A. THIS ITEM INCLUDES DEVELOPMENT OF A SWPPP BY THE CONTRACTOR MEETING ALL LOCAL AND STATE AGENCY REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLY FOR OBTAINING NPDES GENERAL PERMIT #2 INCLUDING NEWSPAPER PUBLICATIONS. B. CONTRACTOR SHALL PROVIDE COPY OF THE APPROVED SWPPP TO THE ENGINEER AND CITY PRIOR TO COMMENCING WORK ON THE PROJECT.
165	9040-A-2	<u>SWPPP MANAGEMENT</u> A. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, ALL WORK REQUIRED TO COMPLY WITH THE ADMINISTRATIVE PROVISIONS OF THE IOWA DNR NPDES GENERAL PERMIT NO. 2; INCLUDING RECORD KEEPING, DOCUMENTATION, UPDATING THE SWPPP, FILING THE NOTICE OF DISCONTINUATION, ETC. WEEKLY INSPECTION REPORTS SHALL BE SENT TO THE ENGINEER 48 HOURS AFTER INSPECTION.
166	9040-F-1	<u>WATTLE, STRAW, 9 INCH</u> A. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, ANCHORING STAKES, MAINTENANCE, REPLACEMENT OF DEFICIENT WATTLE, RESTORATION OF THE AREA TO FINISHED GRADE, AND OFF-SITE DISPOSAL OF THE WATTLE AND ACCUMULATED SEDIMENT.
167	9040-O-1	<u>STABILIZED CONSTRUCTION ENTRANCE</u> A. ITEM INCLUDES THE INSTALLATION AND REMOVAL OF THE ROCK AND SUBGRADE STABILIZATION FABRIC FOR STABILIZED CONSTRUCTION ENTRANCES.
168	9040-T-1	<u>INLET PROTECTION DEVICE</u> A. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, ALL LABOR AND MATERIALS NECESSARY FOR INSTALLATION, REMOVAL AND OFF-SITE DISPOSAL OF ACCUMULATED SEDIMENT, AND REMOVAL OF DEVICE UPON COMPLETION OF THE PROJECT. B. PROTECTION DEVICES SHALL BE UTILIZED ON ALL INTAKES REGARDLESS OF TYPE OF INTAKE
169	11010-A	<u>CONSTRUCTION SURVEY</u> A. THIS ITEM IS FOR ALL SURVEY WORK NECESSARY FOR CONSTRUCTION OF THIS PROJECT AS DETAILED ON THE CONSTRUCTION DOCUMENTS AND APPROVED REVISIONS. ELECTRONIC DRAWINGS ARE AVAILABLE FOR THE CONTRACTORS USE.
170	11010-B	<u>MONUMENT PRESERVATION AND REPLACEMENT</u> A. THE CONTRACTOR SHALL PROVIDE MONUMENT PRESERVATION FOR ANY DISTURBED AREA ON THE PROJECT PER SUDAS 11,010. B. CONTRACTOR SHALL PROVIDE DOCUMENTATION OF ALL EXISTING MONUMENTS PRIOR TO CONSTRUCTION AND SET ANY DISTURBED MONUMENTS AFTER CONSTRUCTION THROUGH A MONUMENT PRESERVATION PLAT.
171	11020-A	<u>MOBILIZATION</u> A. THIS ITEM IS FOR ALL PREPARATORY WORK AND COSTS INCURRED BEFORE BEGINNING THE WORK ON THE PROJECT AND DURING THE PROJECT. THIS ITEM SHALL ALSO INCLUDE THE COSTS FOR ANY STAGED CONSTRUCTION AND EQUIPMENT SET UP TO COMPLETE THE WORK. NO CHANGE IN CONTRACT PRICE WILL BE MADE FOR ANY ADDITIONAL WORK ADDED TO THE CONTRACT. PROJECT CONSTRUCTION IS ANTICIPATED TO BE MULTIPLE CONSTRUCTION SEASONS AND NO ADDITIONAL PAYMENT WILL BE MADE FOR MOBILIZATION BEYOND THE CONTRACT UNIT PRICE.
172	11030-A	<u>MAINTENANCE OF POSTAL SERVICE</u> A. MAIL DELIVERY SHALL BE COORDINATED WITH USPS, UPS, FEDEX, AMAZON AND OTHER DELIVERY SERVICES PRIOR TO EACH PHASE. B. POSTAL SERVICE MAINTENANCE SHALL BE PER SUDAS SECTION 11030

173	11040-B	<u>TEMPORARY GRANULAR SIDEWALK</u> A. THIS ITEM SHALL BE UTILIZED AS DIRECTED BY THE OWNER OR ENGINEER. B. ITEM IS INTENDED TO BE USED DURING UTILITY INSTALLATIONS TO RESTORE SIDEWALK PATH. NOT BE INTENDED TO BE UTILIZED DURING SUBBASES B OR C ANY PHASE. PEDESTRIAN ACCESS DURING SUBBASE B OR C SHALL BE INCIDENTAL TO PEDESTRIAN TRAFFIC CONTROL
174	11040-C	<u>TEMPORARY LONGITUDINAL CHANNELIZING DEVICE</u> A. CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY LONGITUDINAL CHANNELIZING DEVICES PER THE STAGING SHEETS AND APPROVED TEMPORARY PEDESTRIAN TRAFFIC CONTROL REQUIREMENTS. B. NO PAYMENT SHALL BE MADE FOR MOVING CHANNELIZING DEVICE DURING A CONSTRUCTION PHASE. PAYMENT SHALL ONLY BE MADE BASED ON THE INITIAL LENGTH OF CHANNELIZING DEVICE INSTALLED AT THE BEGINNING OF A CONSTRUCTION PHASE.
175	11050-A	<u>CONCRETE WASHOUT</u> A. CONTRACTOR TO PROVIDE AND MAINTAIN A TEMPORARY CONCRETE WASHOUT CONTAINMENT AREA LOCATED WITHIN PROJECT LIMITS.



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DESIGNED	REV	DESCRIPTION	DATE
	A		
DEM		90% PROGRESS PLANS	12/20/2024
DRAWN			
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CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

ESTIMATE REFERENCE NOTES

SHEET

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STORM SEWER STRUCTURES								
STRUCTURE	ALIGNMENT	STATION	OFFSET	TYPE	RIM ELEV	FG ELEV	INLET ELEV	OUTLET ELEV
CO - 1	CENTER STREET SOUTH	55+15.52	-13.00' LT	CLEANOUT	940.99			
CO - 2	CENTER STREET NORTH	56+24.52	-13.00' LT	CLEANOUT	941.15			
IN - 1	CENTER STREET SOUTH	51+76.19	29.62' RT	SW-541 (MODIFIED, TYPE-R GRATE)		932.34	924.10, 36" RCP N 928.20, 15" RCP-E W 925.50, 15" RCP-E SE	924.00, 24" RCP-E S
IN - 2	CENTER STREET SOUTH	52+44.56	30.50' RT	SW-541 (MODIFIED, TYPE-R GRATE)		934.01	924.58, 36" RCP N 929.01, 15" RCP W	924.48, 36" RCP S
IN - 3	CENTER STREET SOUTH	52+44.56	-30.50' LT	SW-507 (TYPE-R GRATE)		934.67		929.62, 15" RCP E
IN - 4	CENTER STREET SOUTH	54+54.28	30.50' RT	SW-541 (MODIFIED, TYPE-R GRATE)		939.53	925.96, 36" RCP N 934.46, 15" RCP W	925.52, 36" RCP S
IN - 5	CENTER STREET SOUTH	54+54.28	-13.00' LT	SW-501 (TYPE-Q GRATE)		939.91		934.84, 15" RCP E
IN - 6	129221 - MAIN STREET CL	10+31.45	15.00' RT	SW-506 (TYPE-Q GRATE)		941.66	936.28, 15" RCP N	926.87, 15" RCP E 926.97, 36" RCP W
IN - 7	129221 - MAIN STREET CL	10+31.45	-12.00' LT	SW-505 (TYPE-Q GRATE)		941.51		936.53, 15" RCP S
IN - 8	129221 - MAIN STREET CL	11+78.87	15.00' RT	SW-506 (TYPE-Q GRATE)		941.24	927.15, 24" RCP E 935.92, 15" RCP N	927.05, 36" RCP W
IN - 9	129221 - MAIN STREET CL	11+78.87	-12.00' LT	SW-505 (TYPE-Q GRATE)		941.19		936.19, 15" RCP S
IN - 10	129221 - MAIN STREET CL	12+85.00	15.00' RT	SW-506 (TYPE-Q GRATE)		941.43	936.14, 15" RCP N 927.75, 24" RCP E	927.65, 24" RCP W
IN - 11	129221 - MAIN STREET CL	12+85.00	-12.00' LT	SW-505 (TYPE-Q GRATE)		941.41		936.41, 15" RCP S
IN - 12	129221 - MAIN STREET CL	13+85.00	15.00' RT	SW-506 (TYPE-Q GRATE)		941.38	936.10, 15" RCP N 928.32, 24" RCP E	928.22, 24" RCP W
IN - 13	129221 - MAIN STREET CL	13+85.00	-12.00' LT	SW-505 (TYPE-Q GRATE)		941.37		936.37, 15" RCP S
IN - 14	129221 - MAIN STREET CL	14+96.96	14.00' RT	SW-507 (TYPE-R GRATE)		941.31	928.90, 15" RCP E 936.13, 15" RCP N	928.80, 24" RCP W
IN - 15	129221 - MAIN STREET CL	15+02.73	-13.00' LT	SW-507 (TYPE-R GRATE)		941.28		936.39, 15" RCP S
IN - 16	129221 - MAIN STREET CL	17+61.10	13.00' RT	SW-505 (TYPE-Q GRATE)		940.29	930.33, 15" RCP E 935.04, 15" RCP N	930.23, 15" RCP W
IN - 17	129221 - MAIN STREET CL	17+61.10	-12.00' LT	SW-505 (TYPE-Q GRATE)		940.29		935.29, 15" RCP S
IN - 18	129221 - MAIN STREET CL	19+11.39	13.00' RT	SW-505 (TYPE-Q GRATE)		939.93	931.48, 15" RCP E 935.20, 15" RCP N	931.39, 15" RCP W
IN - 19	129221 - MAIN STREET CL	19+11.39	-12.00' LT	SW-505 (TYPE-Q GRATE)		939.95		935.45, 15" RCP S
IN - 20	129221 - MAIN STREET CL	21+26.65	13.00' RT	SW-505 (TYPE-Q GRATE)		939.51	932.29, 15" RCP E 934.26, 15" RCP N	932.32, 15" RCP W
IN - 21	129221 - MAIN STREET CL	21+26.65	-12.00' LT	SW-505 (TYPE-Q GRATE)		939.51		934.51, 15" RCP S
IN - 22	129221 - MAIN STREET CL	22+15.02	13.00' RT	SW-505 (TYPE-Q GRATE)		939.24	932.80, 15" RCP E 933.57, 15" RCP N	932.70, 15" RCP W
IN - 23	129221 - MAIN STREET CL	22+15.02	-15.00' LT	SW-505 (TYPE-R GRATE)		939.10		934.26, 15" RCP S
IN - 24	129221 - MAIN STREET CL	23+58.89	13.00' RT	SW-505 (TYPE-Q GRATE)		938.88	933.63, 15" RCP N	933.49, 15" RCP W
IN - 25	129221 - MAIN STREET CL	23+58.89	-12.00' LT	SW-505 (TYPE-Q GRATE)		938.88	933.88, 12" RCP N	933.88, 15" RCP S
IN - 26	CENTER STREET NORTH	57+00.00	-13.00' LT	SW-501 (TYPE-Q GRATE)		940.04		935.04, 15" RCP E
IN - 27	CENTER STREET NORTH	57+00.00	15.00' RT	SW-503 (TYPE-Q GRATE)		940.08	934.76, 15" RCP W	934.66, 24" RCP S
IN - 28	CENTER STREET NORTH	59+00.00	-13.00' LT	SW-501 (TYPE-Q GRATE)		936.87		932.20, 15" RCP E
IN - 29	CENTER STREET NORTH	59+00.00	13.00' RT	SW-501 (TYPE-Q GRATE)		936.87	932.02, 15" RCP W	931.92, 15" RCP N
IN - 30	129221 - MAIN STREET CL	20+16.16	63.29' RT	SW-501 (TYPE-R GRATE)		940.07		935.07, 15" RCP N
IN - 31	129221 - MAIN STREET CL	20+67.16	-24.50' LT	SW-501 (TYPE-R GRATE)		939.68		935.73, 15" RCP SW
MH - 1	129221 - MAIN STREET CL	11+31.91	12.00' RT	SW-401 (84IN)	941.70		926.61, 36" RCP E 926.61, 15" RCP W 933.29, 24" RCP N	926.51, 36" RCP S
MH - 2	129221 - MAIN STREET CL	20+09.02	12.00' RT	SW-401 (48IN)	940.30		931.94, 15" RCP E 934.56, 15" RCP S 935.04, 15" RCP NE	931.66, 15" RCP W

STORM SEWER PIPES						
FROM STRUCTURE	TO STRUCTURE	PIPE DIA	Length	PIPE GRADE	START INV	END INV
IN - 2	IN - 1	36" RCP	64 LF	0.59%	924.48	924.10
IN - 3	IN - 2	15" RCP	61 LF	1.00%	929.62	929.01
IN - 4	IN - 2	36" RCP	206 LF	0.45%	925.52	924.58
IN - 5	IN - 4	15" RCP	40 LF	0.95%	934.84	934.46
IN - 6	MH - 1	36" RCP	97 LF	0.27%	926.87	926.61
IN - 7	IN - 6	15" RCP	25 LF	1.00%	936.53	936.28
IN - 8	MH - 1	36" RCP	40 LF	1.09%	927.05	926.61
IN - 9	IN - 8	15" RCP	27 LF	1.00%	936.19	935.92
IN - 10	IN - 8	24" RCP	103 LF	0.48%	927.65	927.15
IN - 11	IN - 10	15" RCP	25 LF	1.08%	936.41	936.14
IN - 12	IN - 10	24" RCP	97 LF	0.48%	928.22	927.75
IN - 13	IN - 12	15" RCP	25 LF	1.08%	936.37	936.10
IN - 14	IN - 12	24" RCP	110 LF	0.44%	928.80	928.32
IN - 15	IN - 14	15" RCP	28 LF	0.93%	936.39	936.13
IN - 16	IN - 14	15" RCP	259 LF	0.51%	930.23	928.90
IN - 17	IN - 16	15" RCP	25 LF	1.00%	935.29	935.04
IN - 18	IN - 16	15" RCP	144 LF	0.74%	931.39	930.33
IN - 19	IN - 18	15" RCP	25 LF	1.00%	935.45	935.20
IN - 20	MH - 2	15" RCP	114 LF	0.33%	932.32	931.94
IN - 21	IN - 20	15" RCP	25 LF	1.00%	934.51	934.26
IN - 22	IN - 20	15" RCP	82 LF	0.50%	932.70	932.29
IN - 23	IN - 22	15" RCP	26 LF	2.65%	934.26	933.57
IN - 24	IN - 22	15" RCP	137 LF	0.50%	933.49	932.80
IN - 25	IN - 24	15" RCP	25 LF	1.00%	933.88	933.63
IN - 26	IN - 27	15" RCP	28 LF	1.00%	935.04	934.76
IN - 27	MH - 1	24" RCP	137 LF	1.00%	934.66	933.29
IN - 28	IN - 29	15" RCP	26 LF	0.69%	932.20	932.02
IN - 29		15" RCP	44 LF	0.80%	931.92	931.57
IN - 30	MH - 2	15" RCP	51 LF	1.00%	935.07	934.56
IN - 31	MH - 2	15" RCP	67 LF	1.02%	935.73	935.04
MH - 1	IN - 4	36" RCP	99 LF	0.56%	926.51	925.96
MH - 2	IN - 18	15" RCP	94 LF	0.18%	931.66	931.48



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DESIGNED	REV	DESCRIPTION	DATE
	A	90% PROGRESS PLANS	12/20/2024
DRAWN	DEM		
CHECKED	GAB		
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
TABULATIONS

SHEET

C.12

FIRE HYDRANTS						
NO.	STREET NAME	EXISTING HYDRANT	PROPOSED HYDRANT	OFFSET	SIDE	REMARKS
		LOCATION	LOCATION			
		STA.	STA.	FT		
1	MAIN ST	17+89.45	18+09.47	25.05	LT	WM-201
2	MAIN ST	-	20+45.42	37.5	LT	WM-201
3	MAIN ST	-	23+12.96	46.82	RT	WM-201
4	S CENTER ST	-	54+30.85	50.30	LT	WM-201
5	S CENTER ST	55+16.60	55+04.58	51.50	RT	WM-201
6	N CENTER ST	-	59+05.05	37.34	RT	WM-201
7	S 1ST AVE	66+14.32	66+21.56	56.66	LT	WM-201
8	S 2ND AVE	71+02.81	70+86.55	19.51	LT	WM-201

BASEMENT VAULT QUANTITY TABULATION								
BID ITEM	DESCRIPTION	UNIT	ADDRESS					TOTAL QUANTITY
			19 S. CENTER	4 E. MAIN STREET	16 E. MAIN STREET	24 E. MAIN STREET	210 E. MAIN STREET	
1	VAULT - DEMO TOP	SY	83	5	89	56	20	253
2	VAULT - DEMO STAIRS	SF	-	32	-	-	-	32
3	VAULT - INFILL OPENING, SINGLE W/ THE 10 INCH	SF	17	-	-	-	-	17
4	VAULT - INFILL OPENING, SINGLE W/ THE 12 INCH	SF	-	-	44	38	20	102
5	VAULT - INFILL OPENING, DOUBLE W/ THE 24 INCH	SF	18	26	-	-	-	44
6	VAULT - WALL OPENING INFILL, 12" CMU	SF	-	-	36	30	-	66
7	VAULT - WALL OPENING INFILL, CONCRETE	CF	-	-	-	30	-	30
8	VAULT - CMU BLOCK WALL, 12 INCH	SF	66	-	-	-	77	143
9	VAULT - CAST IN PLACE WALL AND DOOR INFILL	CY	-	-	4.6	-	-	4.6
10	VAULT - WALL FOOTING UNDER NB/V WALL	CY	2.2	-	2.9	-	2.3	7.4
11	VAULT - WATERPROOF WALL	SF	334	130	448	266	77	1,255
12	VAULT - DRILLING HOLES IN CONCRETE FLOOR	EA	20	3	18	12	6	59
13	VAULT - GRANULAR FILL	CY	177	20	145	107	37	486
14	VAULT - STAIR REPLACEMENT	EA	2	-	-	-	-	2
15	VAULT - STRUCTURAL SIDEWALK	SY	-	-	5.6	-	-	5.6

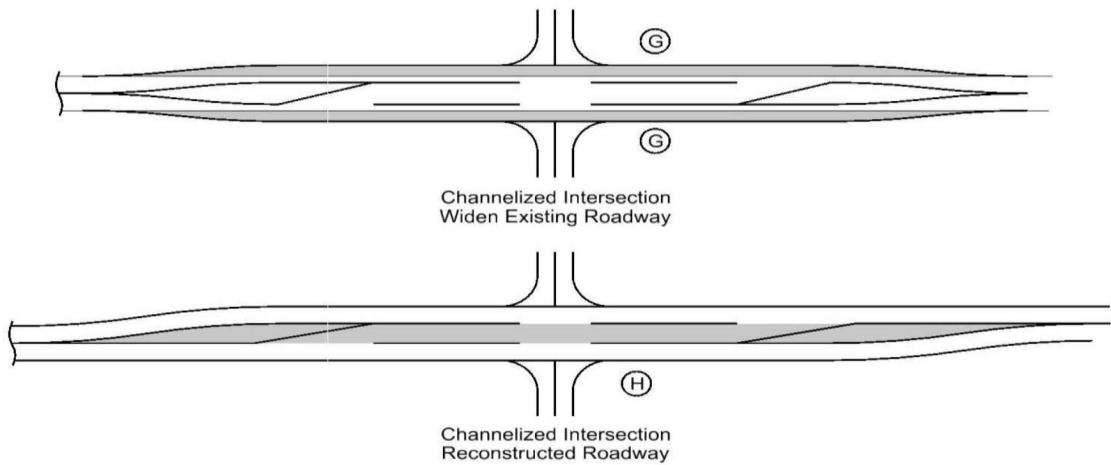
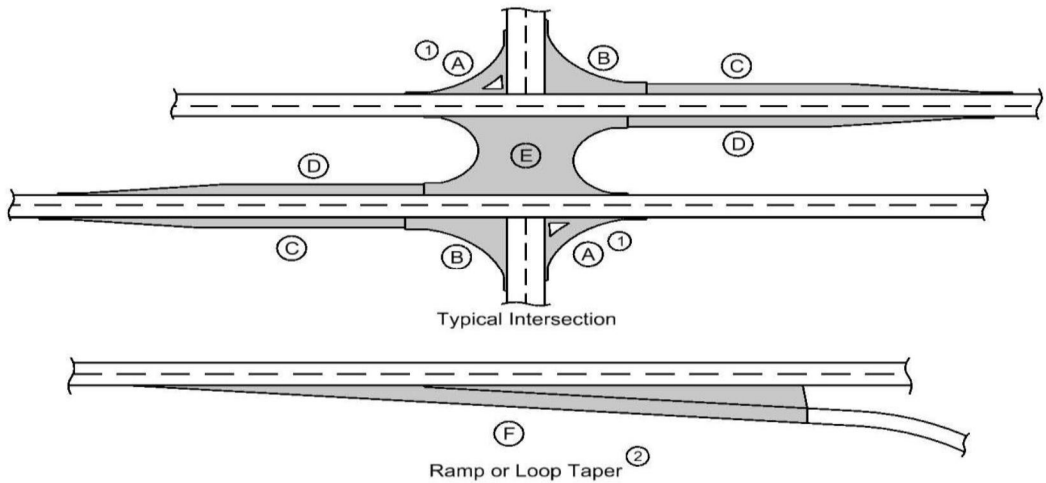
Water Service Tabulation														
ADDRESS									FIRE SERVICE					
									EXISTING FIRE SERVICE REPLACEMENT		INTERNAL FIRE SERVICE WITH DOMESTIC	INTERNAL FIRE SERVICE WITH SEPARATE DOMESTIC	EXTERNAL FIRE SERVICE	FUTURE FIRE SERVICE WITH TEMPORARY HYDRANT
		3/4"	1"	1 1/4"	1 1/2"	1 3/4"	2"	2 1/2"	4"	6"	6"	6"	6"	6"
226	E Main Street	X												
220	E Main Street						X		X					
210	E Main Street						X		X					
202	E Main Street													X
128.5	E Main Street			X						X				
122	E Main Street		X							X				
120	E Main Street	X											X	
118	E Main Street		X										X	
32	E Main Street											X		
30	E Main Street												X	
26	E Main Street		X							X				
24	E Main Street		X						X					
20	E Main Street		X								X			
16	E Main Street		X						X					
14	E Main Street	X									X			
10	E Main Street			X						X				
8	E Main Street		X								X			
4	E Main Street					X			X					
19	N Center Street		X								X			
23	N Center Street	X									X			
25	N Center Street		X											
27	N Center Street	X												
31	N Center Street													X
1	W Main Street						X						X	
2	W Main Street													X
13-15	S Center Street	X										X		
19	S Center Street			X								X		
23	S Center Street	X												
25	S Center Street	X											X	
27	S Center Street		X											
1	E Main Street								X					
109	E Main Street		X							X				
119	E Main Street			X						X				
123	E Main Street	X										X		
125	E Main Street	X							X					
201	E Main Street							X	X					
207-209	E Main Street		X							X				
219	E Main Street	X												
221	E Main Street	X												
225	E Main Street													X

Water Main Fitting Weights			
Item	Weight (lbs)	Quantity	Total (lbs)
Bends			
8X90 °	57	4	228
8X45 °	46	20	920
8X11.25 °	42	4	168
Reducers			
10X8	50	1	50
8X6	36	4	144
Tees			
8X6	72	28	2016
8X4	60	2	120
Crosses			
8X8	105	3	315
Caps			
8	22	1	22
		Total	3983



DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
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PCC PAVEMENT



- ① Does not include raised island area or curb. Refer to tabulation 112-4 for quantities.
② Refer to PV-410, PV-411, PV-412, and PV-414.
③ Quantity includes Pavement Header.

Road Identification	Location			Mainline			Area ⁽³⁾								Total Area By Pavement Thickness		Special Backfill	Modified Subbase	Granular Subbase	Remarks
	Direction of Travel	Station to Station		Width	Length	Area	⁽¹⁾					⁽²⁾								
							SY	SY	SY	SY	SY	SY	SY	SY	SY					
																FT	FT	SY	8 IN	
MAIN STREET	BOTH	10+24.83	10+63.62	23.0	38.8	99.1														
MAIN STREET	BOTH	10+71.62	11+41.91	23.0	70.3	179.6														
MAIN STREET	BOTH	11+71.91	13+18.42	23.0	146.5	374.4														
MAIN STREET	BOTH	13+44.42	14+90.64	23.0	146.2	373.7														
MAIN STREET	BOTH	15+20.64	15+78.40	23.0	57.8	147.6														
MAIN STREET	BOTH	15+86.40	19+65.25	23.0	378.9	968.2														
MAIN STREET	BOTH	19+73.25	20+23.17	23.0	49.9	127.6														
MAIN STREET	BOTH	20+31.17	21+97.12	23.0	166.0	424.1														
MAIN STREET	BOTH	22+09.12	23+93.36	23.0	184.2	470.8														
S CENTER STREET	BOTH	52+00.00	55+27.47	24.0	327.5	873.3														
N CENTER STREET	BOTH	56+06.79	59+41.16	24.0	334.4	891.7														
MAIN STREET	EB	10+24.83	10+71.62	VAR	46.8			45.0												
MAIN STREET	WB	10+24.83	10+71.62	VAR	46.8		31.8													
MAIN STREET	EB	11+41.91	11+97.53	VAR	55.6		61.7													
MAIN STREET	WB	11+41.91	11+97.53	VAR	55.6			46.4												
MAIN STREET	EB	14+52.50	15+20.64	VAR	68.1			74.1												
MAIN STREET	WB	14+52.50	15+20.64	VAR	68.1		69.6													
MAIN STREET	EB	15+78.40	16+57.60	VAR	79.2		96.2													
MAIN STREET	WB	15+78.40	16+57.60	VAR	79.2			75.3												
MAIN STREET	EB	19+03.89	19+73.25	VAR	69.4			69.0												
MAIN STREET	WB	19+03.89	19+73.25	VAR	69.4		48.4													
MAIN STREET	EB	20+23.17	20+97.15	VAR	74.0		71.7													
MAIN STREET	WB	20+23.17	20+97.15	VAR	74.0			62.0												
S CENTER STREET	SB	54+84.52	55+58.52	VAR	74.0			128.7												
S CENTER STREET	NB	54+84.52	55+58.52	VAR	74.0		121.3													
N CENTER STREET	SB	55+81.52	56+51.45	VAR	69.9		108.6													
N CENTER STREET	NB	55+81.52	56+51.45	VAR	69.9			97.3												
S 1ST AVE	SB	66+00.00	66+79.05	VAR	79.1			193.7												
S 1ST AVE	NB	66+00.00	66+79.05	VAR	79.1		167.1													
N 1ST AVE	SB	67+02.05	67+64.83	VAR	62.8		122.0													
N 1ST AVE	NB	67+02.05	67+64.83	VAR	62.8			115.0												
2ND AVE	SB	70+75.00	71+35.07	VAR	60.1			111.7												
2ND AVE	NB	70+75.00	71+35.07	VAR	60.1		112.6													
2ND AVE	SB	71+58.07	72+19.78	VAR	61.7		111.5													
2ND AVE	NB	71+58.07	72+19.78	VAR	61.7			112.1												
MAIN STREET	EB	11+97.53	14+52.50	VAR	255.0				482.2											
MAIN STREET	WB	11+97.53	14+52.50	VAR	255.0				278.7											
MAIN STREET	EB	16+57.60	19+03.89	18.5	246.3				506.3											
MAIN STREET	WB	16+57.60	19+03.89	10.5	246.3				287.3											
MAIN STREET	EB	20+97.15	23+93.36	VAR	296.2				561.6											
MAIN STREET	WB	20+97.15	23+93.36	VAR	296.2				305.6											
S CENTER STREET	NB	51+67.48	52+00.00	VAR	32.5				38.8											
S CENTER STREET	NB	52+00.00	54+84.52	18.5	284.5				584.8											
S CENTER STREET	SB	52+00.00	54+84.52	VAR	284.5				587.5											
N CENTER STREET	NB	56+51.45	59+50.38	VAR	298.9				351.2											
N CENTER STREET	SB	56+51.45	59+50.38	18.5	298.9				614.5											



BOLTON & MENK

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DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DEM			
CHECKED			
GAB			
CLIENT PROJ. NO.			
0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

TABULATIONS

SHEET

C.14

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PAVEMENT MARKING SYMBOLS AND LEGENDS

Refer to PM-111

Road Identification	Location																SCHOOL	XING	STOP	AHEAD	ONLY	BIKE	LANE	EXIT	Groove Cuts	Remarks
	Station	Side																								
MAIN ST	12+25.87	RT													1											
MAIN ST	14+74.88	LT													1											
MAIN ST	16+36.37	LT													1											
MAIN ST	16+45.69	RT													1											
MAIN ST	20+81.03	LT													1											
N CENTER ST	59+41.08	LT													1											
S 1ST AVE	65+98.06	LT													1											
2ND AVE	72+29.80	LT													1											

REMOVAL OF PAVEMENT

Refer to Tabulation 102-5

* Not a Bid Item

Begin Station	End Station	Side	Pavement Type	Area	Saw Cut*	Remarks
				SY	LF	
10+24.83	23+99.47	BOTH	HMA	7025.0		MAIN ST
51+67.54	55+47.98	BOTH	HMA	2345.6		S CENTER ST
55+85.51	59+46.88	BOTH	HMA	2150.4		N CENTER ST
66+00.00	66+67.80	BOTH	HMA	407.9		S 1ST AVE
67+06.26	67+64.82	BOTH	HMA	281.2		N 1ST AVE
70+75.00	71+23.11	BOTH	HMA	216.8		S 2ND AVE
71+61.64	72+19.78	BOTH	HMA	273.2		N 2ND AVE

GRATE INTAKE SEDIMENT FILTER BAG

Possible Detail: 570-7

Location Station	Side	Installation	Maintenance	Removal	Remarks
		EACH	EACH	EACH	
10+31.45	RT	2			MAIN ST
10+31.45	LT	2			MAIN ST
11+78.87	RT	2			MAIN ST
11+78.87	LT	2			MAIN ST
12+85.00	RT	2			MAIN ST
12+85.00	LT	2			MAIN ST
13+85.00	RT	2			MAIN ST
13+85.00	LT	2			MAIN ST
14+96.96	RT	1			MAIN ST
15+02.73	LT	1			MAIN ST
17+61.10	RT	2			MAIN ST
17+61.10	LT	2			MAIN ST
19+11.39	RT	2			MAIN ST
19+11.39	LT	2			MAIN ST
20+61.16	LT	1			MAIN ST
21+26.65	RT	2			MAIN ST
21+26.65	LT	2			MAIN ST
22+15.02	RT	2			MAIN ST
22+15.02	LT	2			MAIN ST
23+58.89	RT	2			MAIN ST
23+58.89	LT	2			MAIN ST
24+21.19	LT	1			OFF-SITE
50+47.59	RT	1			OFF-SITE
50+95.95	RT	1			OFF-SITE
51+52.18	RT	1			OFF-SITE
51+67.75	LT	1			OFF-SITE
51+76.19	RT	1			S CENTER ST
52+44.56	RT	1			S CENTER ST
52+44.56	LT	1			S CENTER ST
54+54.28	RT	1			S CENTER ST
54+54.28	LT	1			S CENTER ST
57+00.00	RT	1			N CENTER ST
57+00.00	LT	1			N CENTER ST
59+00.00	RT	1			N CENTER ST
59+00.00	LT	1			N CENTER ST
59+68.42	RT	1			N CENTER ST
59+68.69	LT	1			N CENTER ST
65+30.17	RT	1			S 1ST AVE
65+32.93	LT	1			S 1ST AVE
70+83.79	RT	1			2ND AVE

SIDEWALK REMOVAL

* Not a bid item

Begin Station	End Station	Area	Saw Cut*	Remarks
		SY	LF	
10+24.82	10+81.15	119.1		N MAIN ST
10+24.82	10+84.80	70.2		S MAIN ST
11+24.36	15+36.43	723.9		N MAIN ST
11+33.27	15+23.98	1193.1		S MAIN ST
15+65.48	17+67.74	337.2		S MAIN ST
15+70.47	16+86.98	229.1		N MAIN ST
17+04.05	17+67.78	101.6		N MAIN ST
17+81.15	19+81.66	343.4		N MAIN ST
17+83.28	19+82.07	354.1		S MAIN ST
20+14.92	21+58.32	276.6		S MAIN ST
20+15.41	22+13.74	332.2		N MAIN ST
21+84.35	22+13.70	48.5		S MAIN ST
22+29.10	23+93.36	291.3		N MAIN ST
22+31.83	23+39.54	183.5		S MAIN ST
23+55.46	23+93.36	48.0		S MAIN ST
23+93.36	23+99.47	5.5		N MAIN ST
51+67.51	52+00.00	42.6		SE CENTER ST
52+00.00	54+86.48	369.6		SE CENTER ST
52+00.00	53+34.40	221.5		SW CENTER ST
53+45.83	55+26.04	213.4		SW CENTER ST
56+06.69	57+87.75	228.2		NW CENTER ST
56+12.76	57+87.59	218.0		NE CENTER ST
58+02.75	59+72.46	261.3		NW CENTER ST
58+03.17	59+46.88	188.3		NE CENTER ST
66+00.00	66+43.03	75.2		SE 1ST AVE
67+26.85	69+11.12	112.3		NW 1ST AVE
67+44.89	67+64.83	20.9		NE 1ST AVE
70+75.00	70+88.92	16.4		SW 2ND AVE
70+75.00	70+91.07	18.9		SE 2ND AVE
71+82.74	72+19.78	44.6		NW 2ND AVE
71+82.59	72+19.77	48.3		NE 2ND AVE

REMOVAL OF INTAKES AND UTILITY ACCESSES

No.	Location/Description	Type	Remarks
1	MAIN ST STA. 11+43.17 35.45' RT	Utilities	STORM MANHOLE
2	MAIN ST STA. 11+66.01 45.66' RT	Utilities	MANHOLE
3	MAIN ST STA. 11+69.44 47.69' RT	Utilities	MANHOLE
4	MAIN ST STA. 11+91.49 20.38' LT	Intakes	
5	MAIN ST STA. 11+91.64 27.96' RT	Intakes	
6	MAIN ST STA. 14+68.23 27.73' RT	Intakes	
7	MAIN ST STA. 14+91.26 47.54' RT	Utilities	MANHOLE
8	MAIN ST STA. 14+93.06 20.03' LT	Intakes	
9	MAIN ST STA. 14+96.22 45.13' RT	Utilities	MANHOLE
10	MAIN ST STA. 15+05.54 42.75' RT	Intakes	
11	MAIN ST STA. 19+28.31 28.31' RT	Intakes	
12	MAIN ST STA. 19+40.82 19.53' LT	Intakes	
13	MAIN ST STA. 19+63.83 18.10' LT	Utilities	STORM MANHOLE
14	MAIN ST STA. 23+64.93 29.07' RT	Intakes	
15	MAIN ST STA. 23+79.02 19.23' LT	Intakes	
16	S CENTER ST STA. 51+76.11 26.55' RT	Intakes	
17	S CENTER ST STA. 53+29.78 27.16' RT	Intakes	
18	S CENTER ST STA. 54+26.63 42.07' LT	Intakes	
19	S CENTER ST STA. 54+83.61 27.29' RT	Intakes	
20	N CENTER ST STA. 58+01.80 19.82' RT	Utilities	STORM MANHOLE
21	N CENTER ST STA. 58+16.81 31.35' LT	Intakes	
22	N CENTER ST STA. 58+19.75 22.51' RT	Intakes	
23	S 1ST AVE STA. 66+18.57 37.97' LT	Intakes	
24	2ND AVE STA. 71+98.89 21.69' LT	Intakes	

REMOVAL OF CONCRETE DRIVES

* Not a Bid Item

Location		Area SY	Saw Cut* LF	Remarks
Station	Side			
16+95.82	LT	34.4		MAIN ST
17+74.29	RT	36.1		MAIN ST
17+75.18	LT	27.8		MAIN ST
21+71.37	RT	45.0		MAIN ST
21+93.53	RT	74.9		MAIN ST, PARKING LOT N
22+20.54	LT	32.2		MAIN ST
22+21.73	RT	33.8		MAIN ST
22+26.51	LT	15.7		MAIN ST, ALLEYWAY
23+47.82	RT	32.4		MAIN ST
23+93.33	RT	9.2		MAIN ST, PARKING LOT
53+42.09	LT	21.3		S CENTER ST
57+94.67	RT	21.4		N CENTER ST
57+95.15	LT	20.7		N CENTER ST



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CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

TABULATIONS

SHEET

C.15

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SANITARY OR STORM SEWER ABANDONMENT OR REMOVAL						110-14 04-16-13
* Not a bid item						
Location/Description	Sanitary or Storm Sewer	Abandonment, Plug Only or Abandonment, Plug and Fill or Removal	Length of Pipe		Fill Material*	Remarks
			≤ 36 inch diameter	> 36 inch diameter	Flowable Mortar or CLSM	
			LF	LF	CY	
MAIN ST, STA. 11+43.17 TO STA. 11+91.64	Storm Sewer	Removal	49			
MAIN ST, STA. 11+91.49 TO STA. 11+91.64	Storm Sewer	Removal	49			
MAIN ST, STA. 14+68.23 TO STA. 14+93.06	Storm Sewer	Removal	54			
MAIN ST, STA. 14+68.23 TO STA. 15+05.54	Storm Sewer	Removal	41			
MAIN ST, STA. 19+28.31 TO STA. 19+40.82	Storm Sewer	Removal	50			
MAIN ST, STA. 19+40.82 TO STA. 19+63.83	Storm Sewer	Removal	23			
MAIN ST, STA. 23+64.93 TO STA. 23+79.02	Storm Sewer	Removal	51			
S CENTER ST, STA. 51+76.11 TO STA. 53+29.78	Storm Sewer	Removal	154			
S CENTER ST, STA. 53+29.78 TO STA. 54+83.61	Storm Sewer	Removal	154			
S CENTER ST, STA. 54+26.63 TO STA. 54+26.63	Storm Sewer	Removal	50			
S CENTER ST, STA. 54+83.61 TO STA. 55+34.95	Storm Sewer	Removal	52			
N CENTER ST, STA. 56+86.58 TO STA. 56+86.61	Storm Sewer	Removal	8			
N CENTER ST, STA. 56+86.58 TO STA. 57+49.44	Storm Sewer	Removal	63			
N CENTER ST, STA. 57+49.44 TO STA. 57+49.46	Storm Sewer	Removal	8			
N CENTER ST, STA. 57+49.44 TO STA. 58+09.95	Storm Sewer	Removal	61			
N CENTER ST, STA. 58+01.79 TO STA. 58+16.81	Storm Sewer	Removal	54			
N CENTER ST, STA. 58+19.29 TO STA. 58+19.29	Storm Sewer	Removal	18			
N CENTER ST, STA. 58+09.95 TO STA. 58+16.81	Storm Sewer	Removal	8			
N CENTER ST, STA. 58+19.29 TO STA. 59+09.97	Storm Sewer	Removal	91			
S 1ST AVE, STA. 66+18.57 TO STA. 66+48.30	Storm Sewer	Removal	31			
N 2ND AVE, STA. 71+65.17 TO STA. 71+98.89	Storm Sewer	Removal	36			

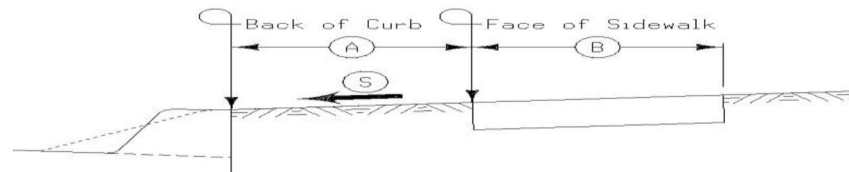
EXISTING SIGNS TO BE REMOVED											190-62 10-15-13
SIGN NUMBER OR DESCRIPTION	LOCATION STATION	DIRECTION OF TRAVEL	TYPE 'A' SIGN ASSEMBLY	TYPE 'B' SIGN ASSEMBLY	REMOVE & REINSTALL EXISTING SIGNS		CONCRETE FOUNDATION	SUPPORT STRUCTURE & FOUNDATION	APPLICABLE SIGNING NOTES	REMARKS	
					TYPE 'A'	TYPE 'B'					
			RA	RB	RR	RR	RF	RS			
			EACH	EACH	EACH	EACH	EACH	EACH			
REGULATORY	10+57.86	EB								MAIN ST, STOP SIGN	
REGULATORY	11+52.83	WB								MAIN ST, STOP SIGN	
REGULATORY	12+50.04	WB								MAIN ST, PARKING	
REGULATORY	12+51.20	EB								MAIN ST, PARKING	
GUIDANCE	13+03.35	EB								MAIN ST, LINCOLN WAY PILLAR	
REGULATORY	14+15.95	EB								MAIN ST, PARKING	
REGULATORY	14+19.66	WB								MAIN ST, PARKING	
REGULATORY	14+75.08	WB								MAIN ST, PARKING	
REGULATORY	14+97.53	EB								MAIN ST, STOP SIGN	
REGULATORY	16+07.36	WB								MAIN ST, STOP SIGN	
REGULATORY	16+55.46	WB								MAIN ST, PARKING	
REGULATORY	16+61.59	EB								MAIN ST, PARKING	
REGULATORY	17+56.34	EB								MAIN ST, HANDICAP	
REGULATORY	17+92.96	WB								MAIN ST, HANDICAP	
REGULATORY	18+79.09	EB								MAIN ST, PARKING	
REGULATORY	18+81.14	WB								MAIN ST, PARKING	
REGULATORY	16+60.77	EB								MAIN ST, STOP SIGN	
REGULATORY	20+43.10	WB								MAIN ST, STOP SIGN	
REGULATORY	21+13.16	EB								MAIN ST, PARKING	
REGULATORY	21+13.45	WB								MAIN ST, PARKING	
REGULATORY	21+83.19	WB								MAIN ST, HANDICAP	
GUIDANCE	22+59.40	EB								MAIN ST, DIRECTIONAL	
REGULATORY	23+02.58	EB								MAIN ST, PARKING	
REGULATORY/GUIDANCE	23+20.33	WB								MAIN ST, PARKING/DIRECTIONAL	
REGULATORY	52+60.35	SB								S CENTER ST, PARKING	
REGULATORY	52+66.11	NB								S CENTER ST, PARKING	
REGULATORY	52+98.11	SB								S CENTER ST, HANDICAP	
GUIDANCE	54+30.12	NB								S CENTER ST, DIRECTIONAL	
REGULATORY	55+24.07	NB								S CENTER ST, STOP SIGN	
REGULATORY	56+09.65	SB								N CENTER ST, STOP SIGN	
REGULATORY	57+04.70	SB								N CENTER ST, PARKING	
REGULATORY	57+51.47	NB								N CENTER ST, PARKING	
REGULATORY	57+83.32	NB								N CENTER ST, DO NOT ENTER	
REGULATORY	58+35.04	SB								N CENTER ST, PARKING	
REGULATORY	58+58.77	SB								N CENTER ST, PARKING	
REGULATORY	58+82.77	NB								N CENTER ST, PARKING	
REGULATORY	59+83.36	SB								N CENTER ST, PARKING	
REGULATORY	59+09.06	SB								N CENTER ST, PARKING	
REGULATORY	66+12.85	SB								S 1ST AVE, HANDICAP	
REGULATORY	66+42.51	NB								S 1ST AVE, STOP SIGN	
REGULATORY	67+32.81	SB								N 1ST AVE, STOP SIGN	
REGULATORY	71+01.45	NB								2ND AVE, STOP SIGN	
REGULATORY	71+88.81	SB								2ND AVE, STOP SIGN	

110-16
04-16-13

REMOVAL OF LIGHT POLES AND CONCRETE FOOTINGS						
Location				Removal of Light Pole	Removal of Concrete Footing for Light Pole	Remarks
No.	Station	Offset				
		Left	Right			
1	10+50.28	X		X	X	MAIN ST
2	10+57.05		X	X	X	MAIN ST
3	11+48.83	X		X	X	MAIN ST
4	11+61.40		X	X	X	MAIN ST
5	12+70.09	X		X	X	MAIN ST
6	12+70.95		X	X	X	MAIN ST
7	13+91.51	X		X	X	MAIN ST
8	13+92.41		X	X	X	MAIN ST
9	14+89.22		X	X	X	MAIN ST
10	15+12.83	X		X	X	MAIN ST
11	15+92.80		X	X	X	MAIN ST
12	16+03.49	X		X	X	MAIN ST
13	17+14.77		X	X	X	MAIN ST
14	17+15.00	X		X	X	MAIN ST
15	18+36.77		X	X	X	MAIN ST
16	18+36.81	X		X	X	MAIN ST
17	19+58.57	X		X	X	MAIN ST
18	19+58.64		X	X	X	MAIN ST
19	20+37.05		X	X	X	MAIN ST
20	20+37.46	X		X	X	MAIN ST
21	21+59.04	X		X	X	MAIN ST
22	21+91.33		X	X	X	MAIN ST
23	22+81.54	X		X	X	MAIN ST
24	22+81.89		X	X	X	MAIN ST
25	23+88.56		X	X	X	MAIN ST
26	23+90.21	X		X	X	MAIN ST
27	51+85.41		X	X	X	S CENTER ST
28	53+55.47	X		X	X	S CENTER ST
29	54+78.52		X	X	X	S CENTER ST
30	56+37.09	X		X	X	N CENTER ST
31	57+76.43		X	X	X	N CENTER ST
32	66+21.29		X	X	X	S 1ST AVE
33	67+34.78		X	X	X	N 1ST AVE
34	70+78.85	X		X	X	2ND AVE

SIDEWALKS

See MI-220 and S Sheets



Road Identification	Station to Station		Side	A	B	S	5" PCC Sidewalk	6" PCC Sidewalk	8" PCC Sidewalk	10" PCC Sidewalk	Detectable Warnings	Remarks
				FT	FT	%	SY	SY	SY	SY	SF	
MAIN ST	10+24.83	10+63.62	RT	VAR	8.00	VAR	70.4					PCC SIDEWALK
MAIN ST	10+24.83	10+63.62	LT	VAR	8.00	VAR	56.4					PCC SIDEWALK
MAIN ST	10+63.62	10+92.73	RT	VAR	8.00	VAR		61.4			32	MAIN/CENTER SW ADA RAMPS
MAIN ST	10+63.62	10+88.56	LT	VAR	8.00	VAR		38.0			32	MAIN/CENTER NW ADA RAMPS
MAIN ST	11+25.64	15+34.46	RT	VAR	8.00	VAR	841.9					EVENT BLOCK PCC SIDEWALK
MAIN ST	11+26.17	11+49.91	LT	VAR	8.00	VAR		35.1			32	MAIN/CENTER NE ADA RAMPS
MAIN ST	11+26.56	11+49.91	RT	VAR	8.00	VAR		44.7			32	MAIN/CENTER SE ADA RAMPS
MAIN ST	11+49.91	15+12.64	LT	VAR	8.00	VAR	416.9					PCC SIDEWALK
MAIN ST	12+28.87	12+33.87	RT	0.00	5.00	VAR		7.3				ADA RAMP TO ON-STREET PARKING
MAIN ST	14+63.01	14+63.01	LT	0.00	5.00	VAR		5.6				ADA RAMP TO ON-STREET PARKING
MAIN ST	15+12.64	15+34.04	RT	VAR	8.00	VAR		43.7			32	MAIN/1ST SW ADA RAMPS
MAIN ST	15+12.64	15+37.67	LT	VAR	VAR	VAR		41.0			32	MAIN/1ST NW ADA RAMPS
MAIN ST	15+62.89	15+86.40	RT	VAR	8.00	VAR		50.2			32	MAIN/1ST SE ADA RAMPS
MAIN ST	15+69.06	15+86.40	LT	VAR	8.00	VAR		23.3			36	MAIN/1ST NE ADA RAMPS
MAIN ST	15+86.40	17+67.28	RT	VAR	VAR	VAR	228.0					PCC SIDEWALK
MAIN ST	15+86.40	16+87.25	LT	VAR	VAR	VAR	141.3					PCC SIDEWALK
MAIN ST	16+46.51	16+46.51	LT	0.00	5.00	VAR		5.6				ADA RAMP TO ON-STREET PARKING
MAIN ST	16+48.69	16+53.69	RT	0.00	5.00	VAR		7.3				ADA RAMP TO ON-STREET PARKING
MAIN ST	17+03.25	19+65.25	LT	VAR	VAR	VAR	314.3					PCC SIDEWALK
MAIN ST	17+83.28	19+65.25	RT	VAR	VAR	VAR	262.0					PCC SIDEWALK
MAIN ST	19+65.25	19+84.26	RT	VAR	8.00	VAR		38.8			36	MAIN/2ND SW ADA RAMPS
MAIN ST	19+65.25	19+82.27	LT	VAR	8.00	VAR		22.5			36	MAIN/2ND NW ADA RAMPS
MAIN ST	20+11.78	20+31.17	RT	VAR	8.00	VAR		39.9			36	MAIN/2ND SE ADA RAMPS
MAIN ST	20+13.76	20+31.17	LT	VAR	8.00	VAR		23.3			36	MAIN/2ND NE ADA RAMPS
MAIN ST	20+31.17	21+57.37	RT	VAR	VAR	VAR	173.6					PCC SIDEWALK
MAIN ST	20+31.17	23+99.47	LT	VAR	VAR	VAR	494.6					PCC SIDEWALK
MAIN ST	20+91.16	20+91.16	LT	0.00	5.00	VAR		5.6				ADA RAMP TO ON-STREET PARKING
MAIN ST	21+76.93	22+13.89	RT	VAR	8.00	VAR	68.2					PCC SIDEWALK
MAIN ST	22+32.25	23+95.67	RT	VAR	VAR	VAR	210.7					PCC SIDEWALK
S CENTER ST	51+67.48	52+00.00	RT	VAR	8.00	VAR	50.2					PCC SIDEWALK
S CENTER ST	52+00.00	54+87.10	RT	VAR	VAR	VAR	335.8					PCC SIDEWALK
S CENTER ST	52+00.00	53+33.83	LT	VAR	8.00	VAR	188.3					PCC SIDEWALK
S CENTER ST	53+45.83	55+27.47	LT	VAR	VAR	VAR	281.1					PCC SIDEWALK
N CENTER ST	56+06.79	57+87.75	LT	VAR	8.00	VAR	237.3					PCC SIDEWALK
N CENTER ST	56+06.79	57+87.37	RT	VAR	VAR	VAR	206.8					PCC SIDEWALK
N CENTER ST	58+02.75	59+72.46	LT	VAR	8.00	VAR	275.6					
N CENTER ST	58+03.37	59+41.16	RT	VAR	VAR	VAR	151.3					PCC SIDEWALK
S 1ST AVE	66+00.00	66+47.51	RT	VAR	VAR	VAR	84.5					PCC SIDEWALK
N 1ST AVE	67+26.85	69+11.01	LT	VAR	VAR	VAR	126.3					PCC SIDEWALK
N 1ST AVE	67+26.85	67+64.83	RT	VAR	8.00	VAR	56.9					PCC SIDEWALK
2ND AVE	70+75.00	71+02.32	LT	VAR	8.00	VAR	39.1					PCC SIDEWALK
2ND AVE	70+75.00	71+02.32	RT	VAR	8.00	VAR	40.5					PCC SIDEWALK
2ND AVE	71+82.74	72+19.78	LT	VAR	8.00	VAR	53.4					PCC SIDEWALK
2ND AVE	71+82.74	72+19.77	RT	VAR	8.00	VAR	57.4					PCC SIDEWALK



1519 BALTIMORE DRIVE
AMES, IOWA 50010
Phone: (515) 233-6100
Email: Ames@bolton-menk.com
www.bolton-menk.com

DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
DEM			
CHECKED			
GAB			
CLIENT PROJ. NO. 0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

TABULATIONS

PAVEMENT MARKING LINE TYPES

See PM-110

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

DCY4: Double Centerline (Yellow) @ 2.00

SLW2: Stop Line (White) @ 6.00

SLW4: Solid Lane Line (White) @ 1.00

STY6: Standard Curb 6" (Yellow) @ 3.03

Road ID			Station to Station			Dir. of Travel	Location			Length by Line Type (Unfactored)														Remarks	
							Marking Type			Side			DCY4	SLW2	SLW4	STY6									
										L	C	R	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA		STA
MAIN ST	10+24.83	10+57.62	BOTH	Waterborne/Solvent Paint			X		0.33																
MAIN ST	11+55.91	15+06.64	BOTH	Waterborne/Solvent Paint			X		3.51																
MAIN ST	15+92.40	19+59.25	BOTH	Waterborne/Solvent Paint			X		3.67																
MAIN ST	20+37.17	23+93.36	BOTH	Waterborne/Solvent Paint			X		3.56																
MAIN ST	10+57.62	10+59.62	EB	Waterborne/Solvent Paint				X		0.16															
MAIN ST	11+53.91	11+55.91	WB	Waterborne/Solvent Paint	X				0.15																
MAIN ST	15+06.64	15+08.64	EB	Waterborne/Solvent Paint				X	0.14																
MAIN ST	15+90.40	15+92.40	WB	Waterborne/Solvent Paint	X				0.14																
MAIN ST	19+59.25	19+61.25	EB	Waterborne/Solvent Paint				X	0.15																
MAIN ST	20+35.17	20+37.17	WB	Waterborne/Solvent Paint	X				0.14																
MAIN ST	10+00.48	10+00.48	WB	Waterborne/Solvent Paint	X				0.08																
MAIN ST	10+02.83	10+02.83	EB	Waterborne/Solvent Paint				X	0.08																
MAIN ST	11+64.64	11+96.95	EB	Waterborne/Solvent Paint				X	1.51																
MAIN ST	11+94.60	12+11.10	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	11+99.01	11+99.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	12+08.74	12+25.24	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	12+21.01	12+21.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	12+25.71	12+60.59	EB	Waterborne/Solvent Paint				X	1.86																
MAIN ST	12+43.01	12+43.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	12+61.06	12+77.56	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	12+65.01	12+65.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	12+75.21	12+91.71	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	12+87.01	12+87.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	12+89.35	13+05.85	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+03.49	13+19.99	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+09.01	13+09.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	13+17.63	13+34.13	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+31.01	13+31.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	13+31.78	13+48.28	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+45.92	13+62.42	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+53.01	13+53.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	13+60.06	13+76.56	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+74.20	13+90.70	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+75.01	13+75.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	13+88.34	14+04.84	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	13+97.01	13+97.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	14+02.49	14+18.99	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	14+17.25	14+33.13	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	14+19.01	14+19.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	14+30.77	14+47.27	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	14+41.01	14+41.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	14+44.91	14+61.41	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	14+59.05	14+75.55	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	14+63.01	14+63.01	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	16+02.46	16+45.06	EB	Waterborne/Solvent Paint				X	2.01																
MAIN ST	16+45.53	16+73.35	EB	Waterborne/Solvent Paint				X	1.33																
MAIN ST	16+46.51	16+46.51	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	16+68.51	16+68.51	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	16+70.99	16+87.49	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	16+85.13	17+01.63	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	16+99.27	17+15.77	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	17+13.42	17+29.92	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	17+27.56	17+44.06	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	17+29.73	17+29.73	WB	Waterborne/Solvent Paint	x				0.09																
MAIN ST	17+51.73	17+51.73	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	17+73.73	17+73.73	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	17+95.73	17+95.73	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	18+02.45	18+18.95	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	18+16.59	18+33.09	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	18+17.73	18+17.73	WB	Waterborne/Solvent Paint	X				0.09																
MAIN ST	18+30.74	18+47.24	EB	Waterborne/Solvent Paint				X	0.24																
MAIN ST	18+39.73	18+39.73																							



**BOLTON
& MENK**

1519 BALTIMORE DRIVE
AMES, IOWA 50010
Phone: (515) 233-6100
Email: Ames@bolton-menk.com
www.bolton-menk.com

DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
DEM			
CHECKED			
GAB			
CLIENT PROJ. NO. 0A1.129221			

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11/10/2024 12:22:11 PM C:\DATA\129221\001.dwg 2/5/2025 10:16:29 AM

PAVEMENT MARKING LINE TYPES

See PM-110

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

DCY4: Double Centerline (Yellow) @ 2.00

SLW2: Stop Line (White) @ 6.00

SLW4: Solid Lane Line (White) @ 1.00

STY6: Standard Curb 6" (Yellow) @ 3.03

Location				Length by Line Type (Unfactored)																	Remarks		
Road ID	Station to Station		Dir. of Travel	Marking Type	Side			DCY4	SLW2	SLW4	STY6												
					L	C	R																
MAIN ST	21+35.16	21+35.16	WB	Waterborne/Solvent Paint	X			STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	
MAIN ST	21+57.16	21+79.16	WB	Waterborne/Solvent Paint	X					0.09													
MAIN ST	22+43.25	22+59.75	EB	Waterborne/Solvent Paint			X			0.24													
MAIN ST	22+47.40	22+47.40	WB	Waterborne/Solvent Paint	X					0.09													
MAIN ST	22+57.39	22+73.89	EB	Waterborne/Solvent Paint			X			0.24													
MAIN ST	22+69.40	22+69.40	WB	Waterborne/Solvent Paint	X					0.09													
MAIN ST	22+71.53	22+88.03	EB	Waterborne/Solvent Paint			X			0.24													
MAIN ST	22+85.67	23+02.17	EB	Waterborne/Solvent Paint			X			0.24													
MAIN ST	22+91.40	22+91.40	WB	Waterborne/Solvent Paint	X					0.09													
MAIN ST	22+99.82	23+16.32	EB	Waterborne/Solvent Paint			X			0.24													
MAIN ST	23+13.40	23+13.40	WB	Waterborne/Solvent Paint	X					0.09													
MAIN ST	23+13.96	23+30.41	EB	Waterborne/Solvent Paint			X			0.09													
MAIN ST	23+28.10	23+44.55	EB	Waterborne/Solvent Paint			X			0.09													
MAIN ST	23+35.40	23+35.40	WB	Waterborne/Solvent Paint	X					0.09													
MAIN ST	23+42.24	23+58.69	EB	Waterborne/Solvent Paint			X			0.09													
MAIN ST	23+57.40	23+57.40	WB	Waterborne/Solvent Paint	X					0.09													
MAIN ST	10+30.00	10+62.63	EB	Waterborne/Solvent Paint			X				0.36												
MAIN ST	10+37.30	10+62.64	WB	Waterborne/Solvent Paint	X						0.27												
MAIN ST	10+72.51	10+83.16	WB	Waterborne/Solvent Paint	X						0.14												
MAIN ST	10+72.54	10+89.33	EB	Waterborne/Solvent Paint			X				0.23												
MAIN ST	11+29.95	11+40.92	EB	Waterborne/Solvent Paint			X				0.17												
MAIN ST	11+31.56	11+41.03	WB	Waterborne/Solvent Paint	X						0.12												
MAIN ST	11+50.86	11+64.64	EB	Waterborne/Solvent Paint			X				0.14												
MAIN ST	11+50.88	11+78.15	WB	Waterborne/Solvent Paint	X						0.29												
MAIN ST	14+65.54	15+11.71	EB	Waterborne/Solvent Paint			X				0.52												
MAIN ST	14+92.79	15+11.67	WB	Waterborne/Solvent Paint	X						0.20												
MAIN ST	15+21.43	15+31.37	EB	Waterborne/Solvent Paint			X				0.16												
MAIN ST	15+21.53	15+32.85	WB	Waterborne/Solvent Paint	X						0.15												
MAIN ST	15+65.55	15+77.57	EB	Waterborne/Solvent Paint			X				0.19												
MAIN ST	15+73.87	15+77.67	WB	Waterborne/Solvent Paint	X						0.06												
MAIN ST	15+87.31	16+13.93	WB	Waterborne/Solvent Paint	X						0.28												
MAIN ST	15+87.36	16+28.69	EB	Waterborne/Solvent Paint			X				0.47												
MAIN ST	16+68.51	16+84.32	WB	Waterborne/Solvent Paint	X						0.18												
MAIN ST	17+06.17	17+29.73	WB	Waterborne/Solvent Paint	X						0.25												
MAIN ST	17+27.56	17+64.35	EB	Waterborne/Solvent Paint			X				0.39												
MAIN ST	17+86.21	18+02.45	EB	Waterborne/Solvent Paint			X				0.18												
MAIN ST	19+15.59	19+64.35	EB	Waterborne/Solvent Paint			X				0.55												
MAIN ST	19+27.73	19+64.35	WB	Waterborne/Solvent Paint	X						0.40												
MAIN ST	19+73.98	19+77.41	WB	Waterborne/Solvent Paint	X						0.05												
MAIN ST	19+73.98	19+81.94	EB	Waterborne/Solvent Paint			X				0.14												
MAIN ST	20+14.09	20+22.43	EB	Waterborne/Solvent Paint			X				0.15												
MAIN ST	20+18.62	20+22.43	WB	Waterborne/Solvent Paint			X				0.06												
MAIN ST	20+32.07	20+51.96	EB	Waterborne/Solvent Paint			X				0.20												
MAIN ST	20+32.07	20+58.59	WB	Waterborne/Solvent Paint	X						0.28												
MAIN ST	21+22.87	21+54.44	EB	Waterborne/Solvent Paint			X				0.33												
MAIN ST	21+76.93	22+13.89	EB	Waterborne/Solvent Paint			X				0.66												
MAIN ST	21+79.16	21+93.94	WB	Waterborne/Solvent Paint	X						0.17												
MAIN ST	22+29.05	22+47.40	WB	Waterborne/Solvent Paint	X						0.20												
MAIN ST	22+35.18	22+43.25	EB	Waterborne/Solvent Paint			X				0.10												
MAIN ST	23+42.24	23+93.85	EB	Waterborne/Solvent Paint			X				0.54												
MAIN ST	23+79.40	23+99.47	WB	Waterborne/Solvent Paint	X						0.23												
S CENTER ST	52+00.00	55+21.47	BOTH	Waterborne/Solvent Paint		X		3.21															
S CENTER ST	55+21.47	55+23.47	NB	Waterborne/Solvent Paint			X		0.16														
S CENTER ST	51+68.48	52+23.25	NB	Waterborne/Solvent Paint			X			3.33													
S CENTER ST	52+05.35	52+23.22	SB	Waterborne/Solvent Paint	X					0.25													
S CENTER ST	52+19.49	52+36.62	SB	Waterborne/Solvent Paint	X					0.24													
S CENTER ST	52+20.90	52+37.40	NB	Waterborne/Solvent Paint			X			0.23													
S CENTER ST	52+33.63	52+50.12	SB	Waterborne/Solvent Paint	X					0.23													
S CENTER ST	52+35.04	52+51.54	NB	Waterborne/Solvent Paint			X			0.23													
S CENTER ST	52+47.77	52+64.26	SB	Waterborne/Solvent Paint	X					0.23													
S CENTER ST	52+49.18	52+65.68	NB	Waterborne/Solvent Paint			X			0.23													
S CENTER ST	52+61.91	52+78.40	SB	Waterborne/Solvent Paint	X					0.23													
S CENTER ST	52+63.32	52+79.82	NB	Waterborne/Solvent Paint			X			0.23													
S CENTER ST	52+76.05	52+92.54	SB	Waterborne/Solvent Paint	X					0.23													
S CENTER ST	52+77.46	52+93.96	NB	Waterborne/Solvent Paint			X			0.23													
S CENTER ST	52+90.19	53+06.69	SB	Waterborne/Solvent Paint	X					0.23													
S CENTER ST	52+91.61	53+08.11	NB	Waterborne/Solvent Paint			X			0.23													
S CENTER ST	53+04.33	53+20.83	SB	Waterborne/Solvent Paint	X					0.23													
S CENTER ST	53+05.75	53+22.25	NB	Waterborne/Solvent Paint			X			0.23													
S CENTER ST	53+19.89	53+36.39	NB	Waterborne/Solvent Paint			X																



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CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

TABULATIONS

SHEET

C.19

PAVEMENT MARKING LINE TYPES

See PM-110

***MNY4 - Factor of 1.00 as value includes number of 4-inch passes to cover median nose area.

*BCY4 - Place on the same side of the roadway to match existing markings near the project.

**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

DCY4: Double Centerline (Yellow) @ 2.00

SLW2: Stop Line (White) @ 6.00

SLW4: Solid Lane Line (White) @ 1.00

STY6: Standard Curb 6" (Yellow) @ 3.03

Road ID			Station to Station			Dir. of Travel	Location			Length by Line Type (Unfactored)														Remarks	
							Marking Type			Side			DCY4	SLW2	SLW4	STY6									
										L	C	R	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA	STA		STA
S CENTER ST	54+16.54	54+33.03	SB	Waterborne/Solvent	Paint		X						0.23												
S CENTER ST	54+18.89	54+35.39	NB	Waterborne/Solvent	Paint			X					0.23												
S CENTER ST	54+30.68	54+47.17	SB	Waterborne/Solvent	Paint		X						0.23												
S CENTER ST	54+33.03	54+49.53	NB	Waterborne/Solvent	Paint			X					0.23												
S CENTER ST	54+44.82	54+61.31	SB	Waterborne/Solvent	Paint		X						0.23												
S CENTER ST	54+47.17	54+63.67	NB	Waterborne/Solvent	Paint			X					0.23												
S CENTER ST	54+58.96	54+75.45	SB	Waterborne/Solvent	Paint		X						0.23												
S CENTER ST	54+61.31	54+77.81	NB	Waterborne/Solvent	Paint			X					0.23												
S CENTER ST	51+73.10	54+89.60	SB	Waterborne/Solvent	Paint		X						0.23												
S CENTER ST	54+75.45	54+91.95	NB	Waterborne/Solvent	Paint			X					0.23												
S CENTER ST	54+86.24	55+15.52	SB	Waterborne/Solvent	Paint		X					1.29													
S CENTER ST	52+00.00	52+23.22	SB	Waterborne/Solvent	Paint		X						0.23												
S CENTER ST	53+20.83	53+30.90	SB	Waterborne/Solvent	Paint		X						0.12												
S CENTER ST	53+48.76	53+76.45	SB	Waterborne/Solvent	Paint		X						0.29												
S CENTER ST	55+06.95	55+26.49	NB	Waterborne/Solvent	Paint			X					0.20												
S CENTER ST	55+15.52	55+26.49	SB	Waterborne/Solvent	Paint		X						0.11												
N CENTER ST	56+12.79	59+41.16	BOTH	Waterborne/Solvent	Paint			X		3.28															
N CENTER ST	56+10.79	56+12.79	BOTH	Waterborne/Solvent	Paint		X				0.14														
N CENTER ST	56+24.52	57+49.40	NB	Waterborne/Solvent	Paint				X			5.40													
N CENTER ST	56+42.76	56+59.27	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	56+56.90	56+73.41	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	56+71.04	56+87.55	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	56+85.18	57+01.68	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	56+99.33	57+15.82	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	57+13.47	27+29.97	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	57+27.61	57+44.11	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	57+41.75	57+58.25	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	57+71.40	57+71.10	NB	Waterborne/Solvent	Paint				X			0.09													
N CENTER ST	58+25.66	58+42.16	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	58+26.20	58+26.20	NB	Waterborne/Solvent	Paint				X			0.09													
N CENTER ST	58+39.81	58+56.30	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	58+48.20	58+48.20	NB	Waterborne/Solvent	Paint				X			0.09													
N CENTER ST	58+53.95	58+70.45	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	58+68.09	58+84.59	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	58+70.20	58+70.20	NB	Waterborne/Solvent	Paint				X			0.09													
N CENTER ST	58+82.24	58+98.73	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	58+92.20	58+92.20	NB	Waterborne/Solvent	Paint				X			0.09													
N CENTER ST	58+96.38	59+12.88	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	59+10.52	59+27.02	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	59+14.20	59+14.20	NB	Waterborne/Solvent	Paint				X			0.09													
N CENTER ST	59+24.66	59+41.08	SB	Waterborne/Solvent	Paint		X					0.24													
N CENTER ST	59+41.63	59+65.95	SB	Waterborne/Solvent	Paint		X					1.02													
N CENTER ST	56+07.71	56+24.52	NB	Waterborne/Solvent	Paint				X			0.17													
N CENTER ST	56+07.71	56+31.59	SB	Waterborne/Solvent	Paint		X					0.25													
N CENTER ST	57+71.40	57+84.44	NB	Waterborne/Solvent	Paint				X			0.15													
N CENTER ST	57+72.31	57+84.82	SB	Waterborne/Solvent	Paint		X					0.14													
N CENTER ST	58+05.68	58+42.18	SB	Waterborne/Solvent	Paint		X					0.38													
N CENTER ST	58+06.30	58+26.20	NB	Waterborne/Solvent	Paint				X			0.22													
S 1ST AVE	66+00.00	66+41.51	BOTH	Waterborne/Solvent	Paint			X		0.42															
S 1ST AVE	66+41.51	66+43.51	NB	Waterborne/Solvent	Paint				X		0.14														
S 1ST AVE	65+53.51	65+63.80	SB	Waterborne/Solvent	Paint		X					0.24													
S 1ST AVE	65+64.21	65+74.51	SB	Waterborne/Solvent	Paint		X					0.24													
S 1ST AVE	65+74.91	65+85.20	SB	Waterborne/Solvent	Paint		X					0.24													
S 1ST AVE	65+85.60	65+95.89	SB	Waterborne/Solvent	Paint		X					0.24													
S 1ST AVE	65+98.27	65+98.27	NB	Waterborne/Solvent	Paint				X			0.09													
S 1ST AVE	66+00.00	66+24.23	SB	Waterborne/Solvent	Paint		X					1.01													
S 1ST AVE	66+00.00	66+46.52	SB	Waterborne/Solvent	Paint		X						0.56												
S 1ST AVE	66+20.27	66+46.52	NB	Waterborne/Solvent	Paint				X			0.29													
N 1ST AVE	67+32.85	67+64.83	BOTH	Waterborne/Solvent	Paint			X		0.32															
N 1ST AVE	67+30.85	67+32.85	SB	Waterborne/Solvent	Paint		X				0.14														
N 1ST AVE	67+85.98	67+85.98	NB	Waterborne/Solvent	Paint				X			0.09													
N 1ST AVE	67+86.15	67+86.15	SB	Waterborne/Solvent	Paint		X					0.09													
N 1ST AVE	67+27.79	67+64.77	NB	Waterborne/Solvent	Paint				X				0.40												
N 1ST AVE	67+27.79	67+64.83	SB	Waterborne/Solvent	Paint		X					0.41													
2ND AVE	70+75.00	70+96.32	BOTH	Waterborne/Solvent	Paint			X		0.21															
2ND AVE	71+88.74	72+19.78	BOTH	Waterborne/Solvent	Paint			X		0.31															



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

TABULATIONS

SHEET

C.20

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102-3
10-16-18

ACCESS POINTS AND SAFETY RAMPS

Refer to Cross-Sections

Length of Unclassified Pipe calculated is based on using Corrugated Metal Pipe.
① Refer to MI-210
② Refer to EW-501.
③ Refer to EW-501 or EW-502.
*Predetermined for access point not constructed with this project.

Location		Type	Length of Opening ①			W	① ② PR	② SR	Pipe Culvert ③					Aprons	Driveway Surface Area		Driveway Surfacing Material	Remarks
Station	Side	A, B, C, Safety Ramp, or Predetermined*	Case	2" Dropped Curb	3" Dropped Curb				H	Size	Pipe Length	Lt.	Rt.		HMA	PCC		
			1 or 2	LF	LF	FT	FT	FT		IN	LF	LF	LF		SY	SY	TON	
16+95.25	LT		1	38.0		16.0										33.0		
17+75.25	RT		1	38.0		16.0										33.1		MAIN ST, 7" DRIVEWAY, BANK DRIVE-THRU
21+71.37	RT		1	30.6		19.6										34.9		MAIN ST, 8" DRIVEWAY, ALLEYWAY
21+93.53	RT		-			-										74.9		MAIN ST, 7" DRIVEWAY, PARKING LOT ENTRANCE, ONE-WAY
22+23.07	RT		1	29.4		18.4										33.1		MAIN ST, 7" PARKING LOT N REPLACEMENT
22+26.51	LT		-			-										15.7		MAIN ST, 8" DRIVEWAY, ALLEYWAY/PARKING LOT EXIT, ONE-WAY
23+93.33	RT		-													9.2		MAIN ST, 8" ALLEYWAY REPLACEMENT
53+39.83	LT		1	34.0		12.0										28.7		MAIN ST, 7" PARKING LOT REPLACEMENT
57+95.25	LT		1	37.0		15.2										28.3		CENTER ST, 8" DRIVEWAY, ALLEYWAY
57+95.37	RT		1	38.0		16.0										28.6		CENTER ST, 8" DRIVEWAY, ALLEYWAY

104-5C
10-17-17

LIST OF SUBDRAIN WORK

Possible Standards: DR-121, DR-201, DR-203, DR-301, DR-302, DR-303, DR-305 and DR-306. Possible Detail: 500-10.

* Not a bid item

Location			Pipe			Aprons		Outlets				Connected Pipe Joints*		Trench Drain	Granular Material	Porous Backfill*	Class "A" Crushed Stone*	Remarks
No.	Station to Station		Concrete, C.M.P., or Plastic	Dia.	Length	DR-201	DR-203	500-10	DR-305		DR-306							
				IN	LF	No.	No.	No.	Type	No.	No.							
DR-301, DR-302, DR-303													DR-121		LF	Blanket CY	CY	
										Type	No.							
1	10+35.28	11+75.04	Plastic	6.0	140													
2	11+82.70	12+81.17	Plastic	6.0	98													
3	12+88.83	13+81.17	Plastic	6.0	92													
4	13+88.83	15+00.23	Plastic	6.0	112													
5	15+05.23	17+57.27	Plastic	6.0	252													
6	17+64.93	19+07.55	Plastic	6.0	143													
7	19+15.22	21+22.82	Plastic	6.0	208													
8	21+30.48	22+11.19	Plastic	6.0	81													
9	22+18.85	23+55.06	Plastic	6.0	137													
10	52+47.06	54+52.28	Plastic	6.0	213													
11	54+56.28	55+15.52	Plastic	6.0	59													
12	56+24.52	56+98.00	Plastic	6.0	73													
13	57+02.00	58+98.00	Plastic	6.0	196													
14	57+02.00	58+98.00	Plastic	6.0	196													



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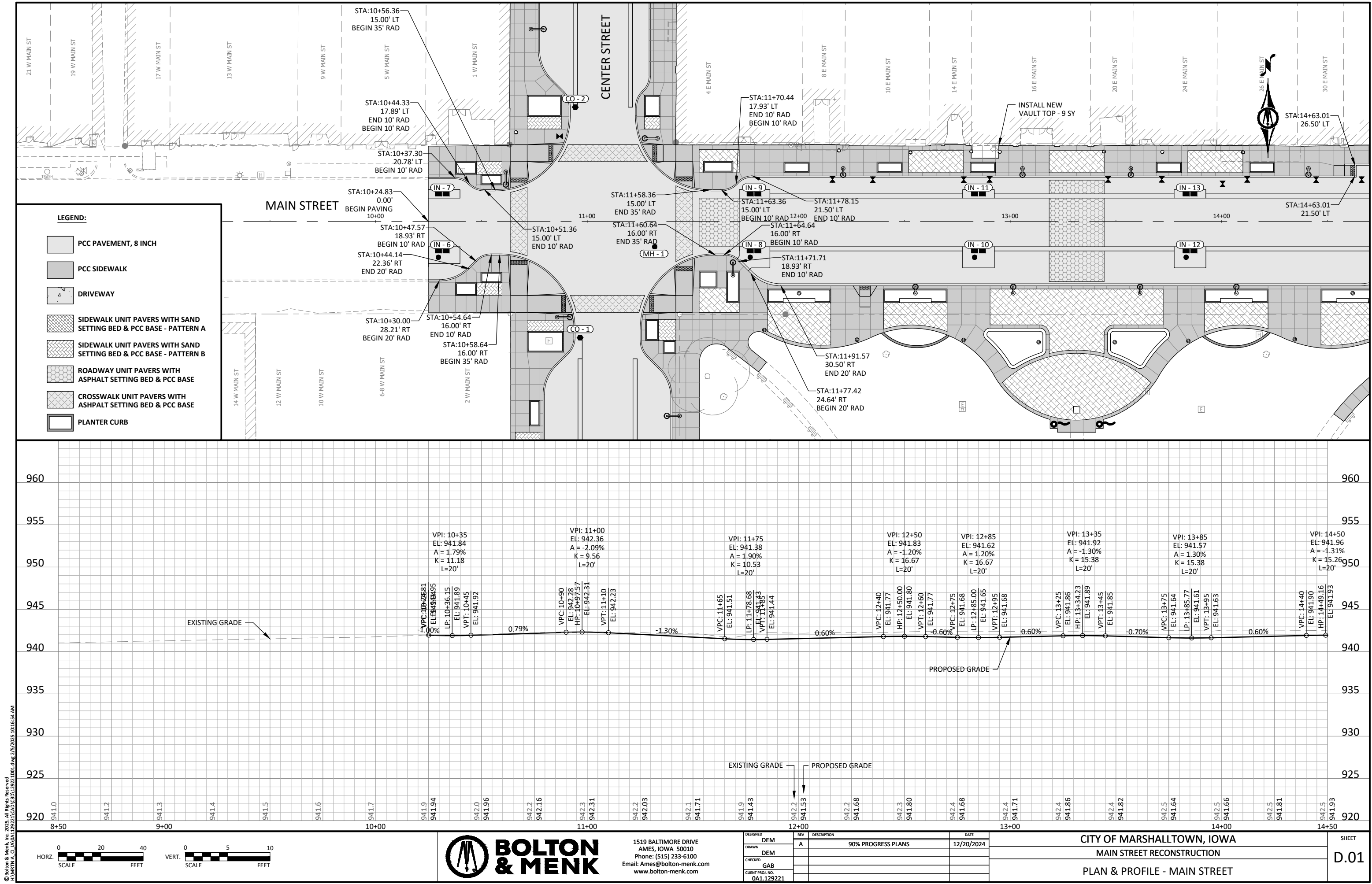
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
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C.21



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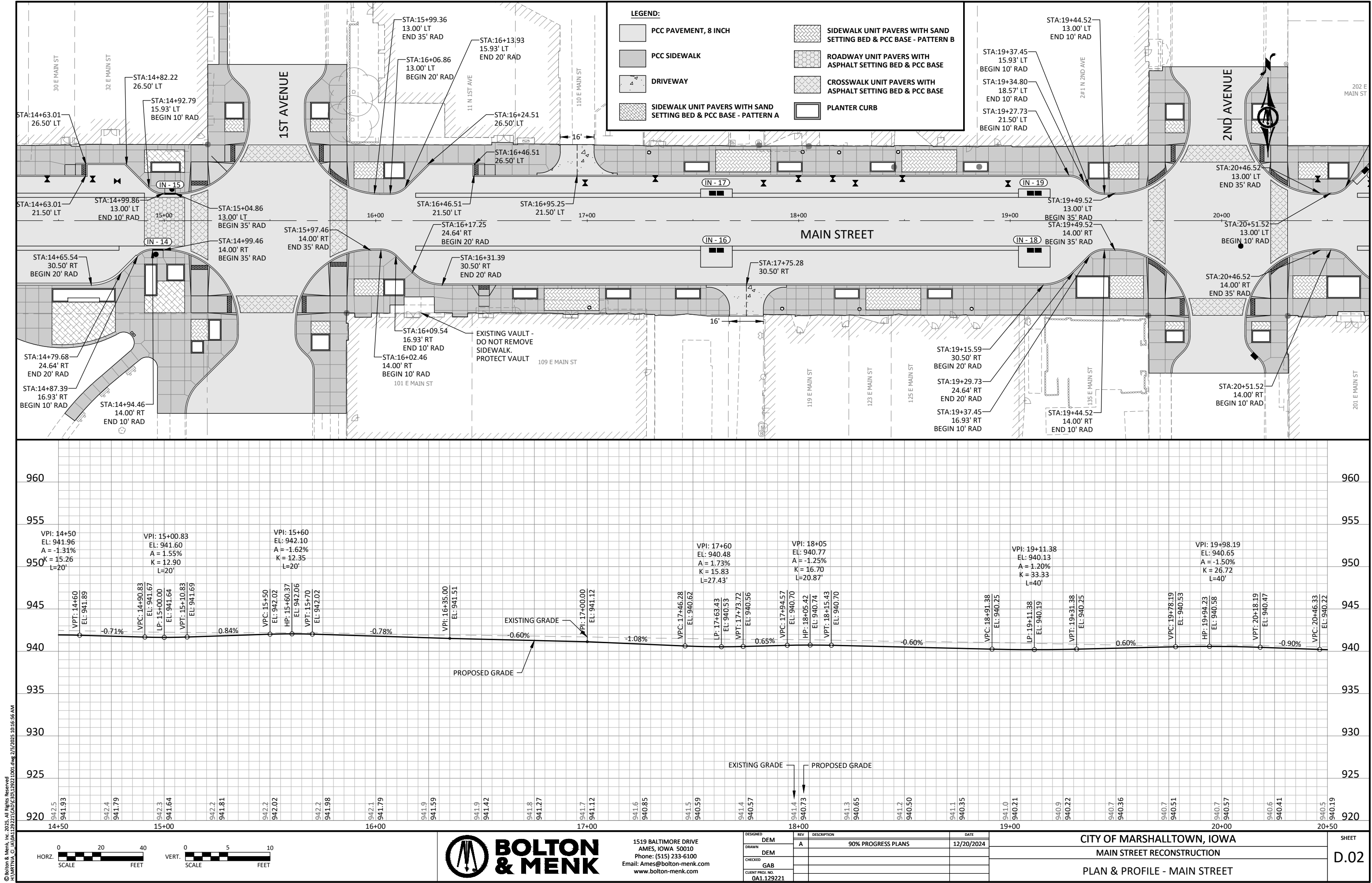


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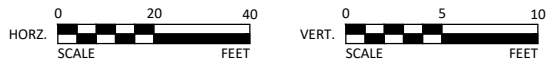
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
PLAN & PROFILE - MAIN STREET

SHEET
D.01



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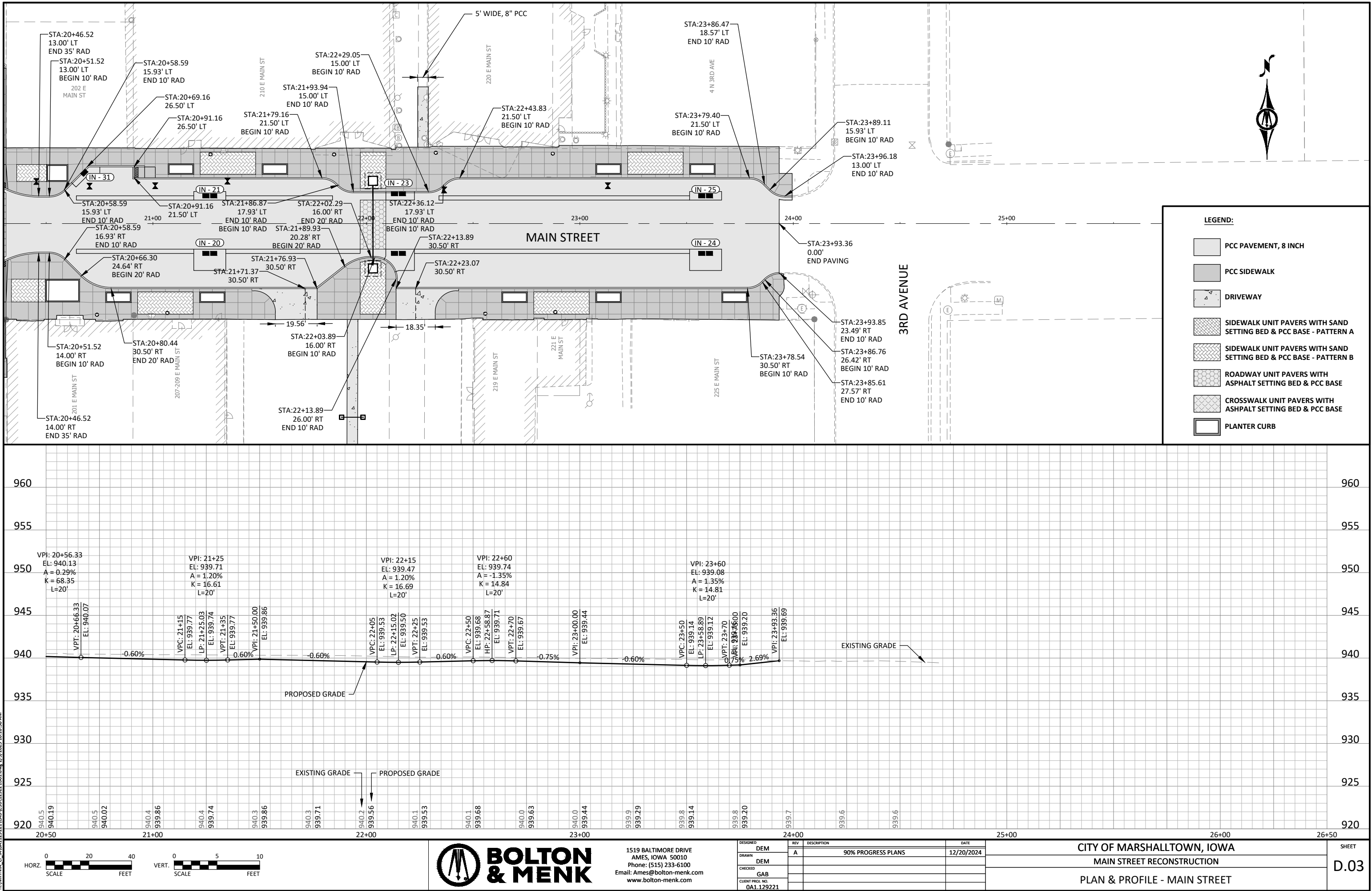
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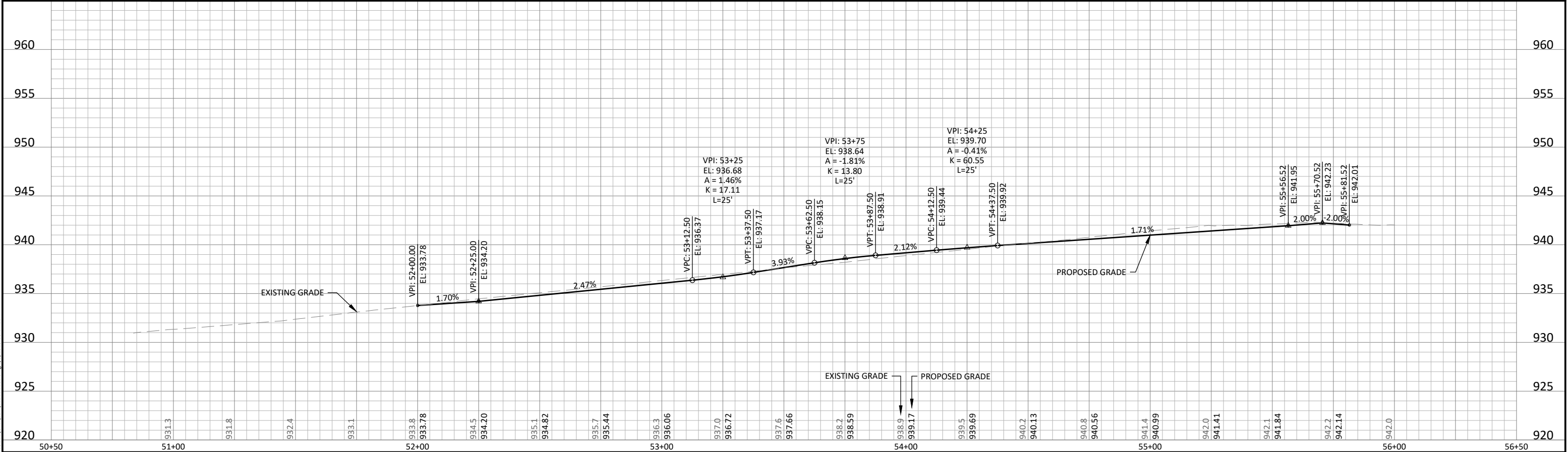
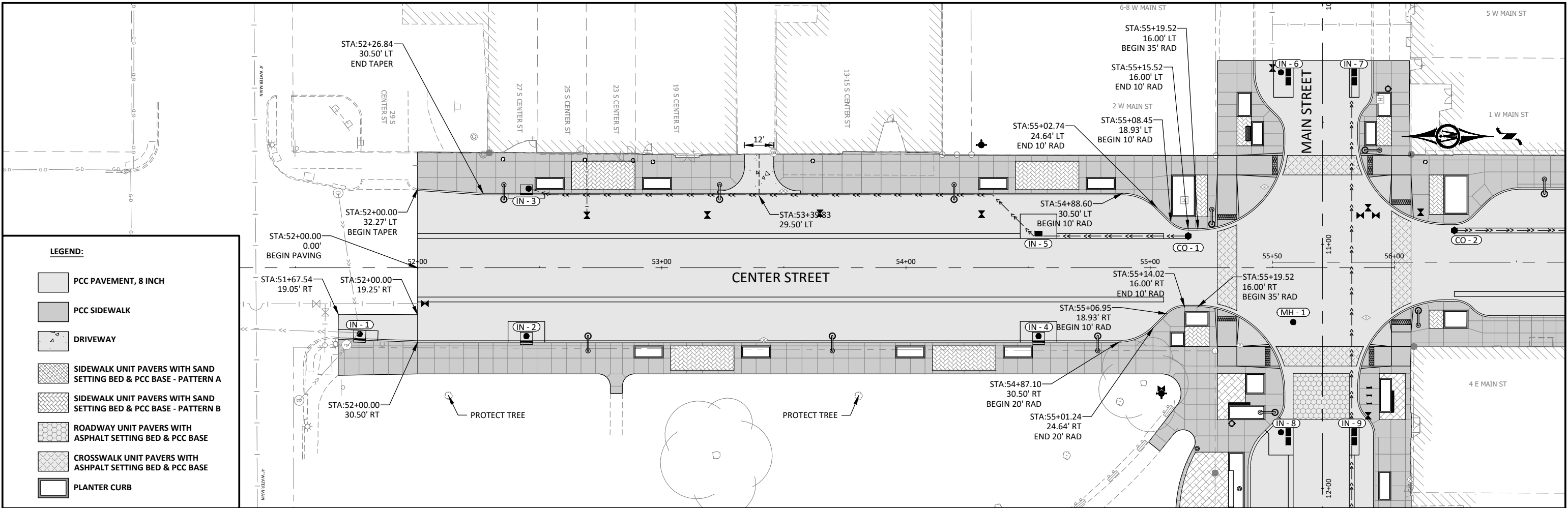
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DEM	A	90% PROGRESS PLANS	12/20/2024
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CHECKED	GAB		
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MAIN STREET RECONSTRUCTION
PLAN & PROFILE - MAIN STREET

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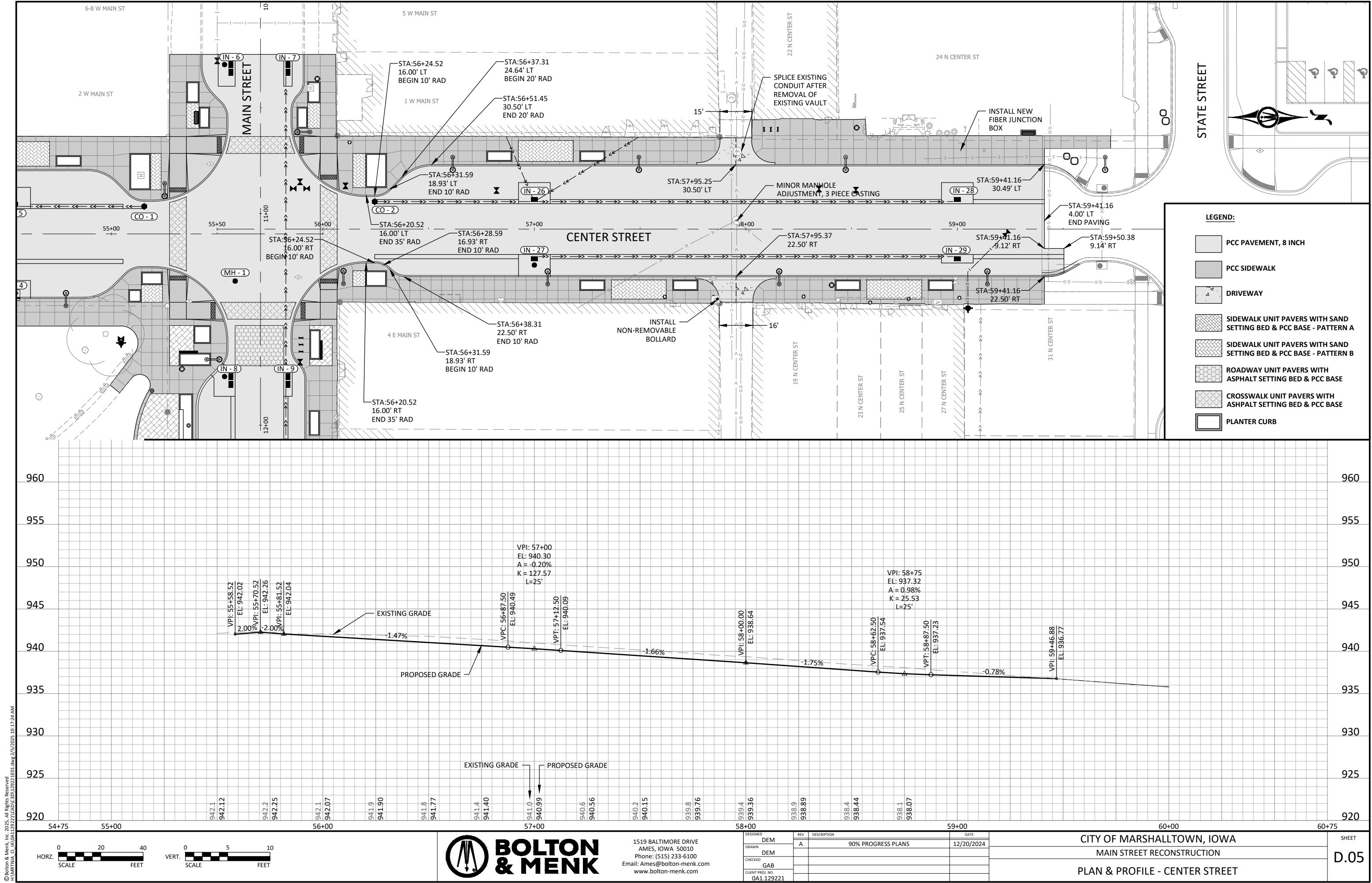


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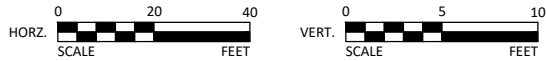
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
PLAN & PROFILE - CENTER STREET

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D.04



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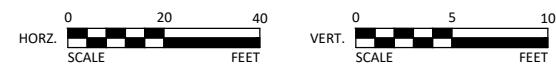
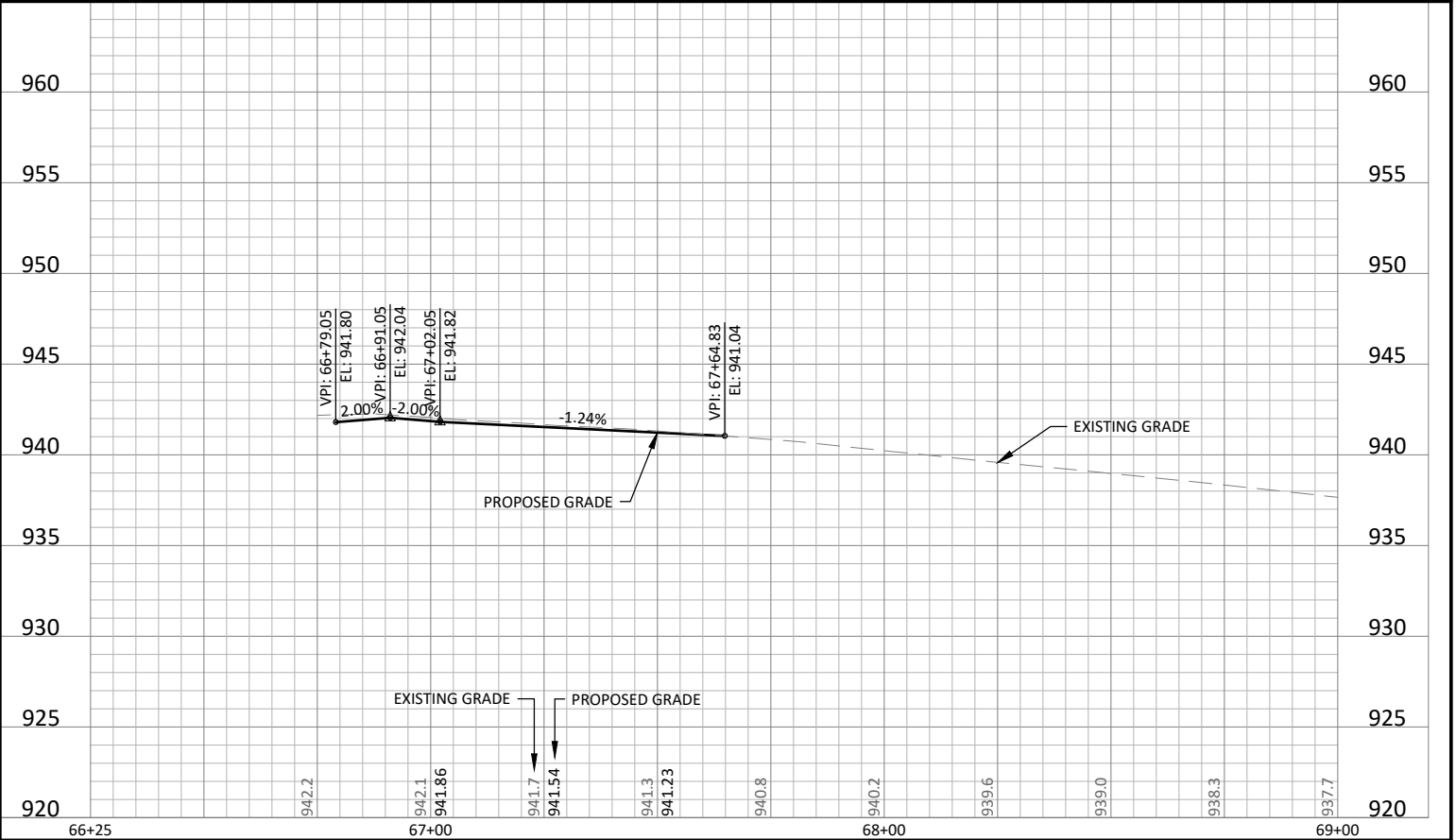
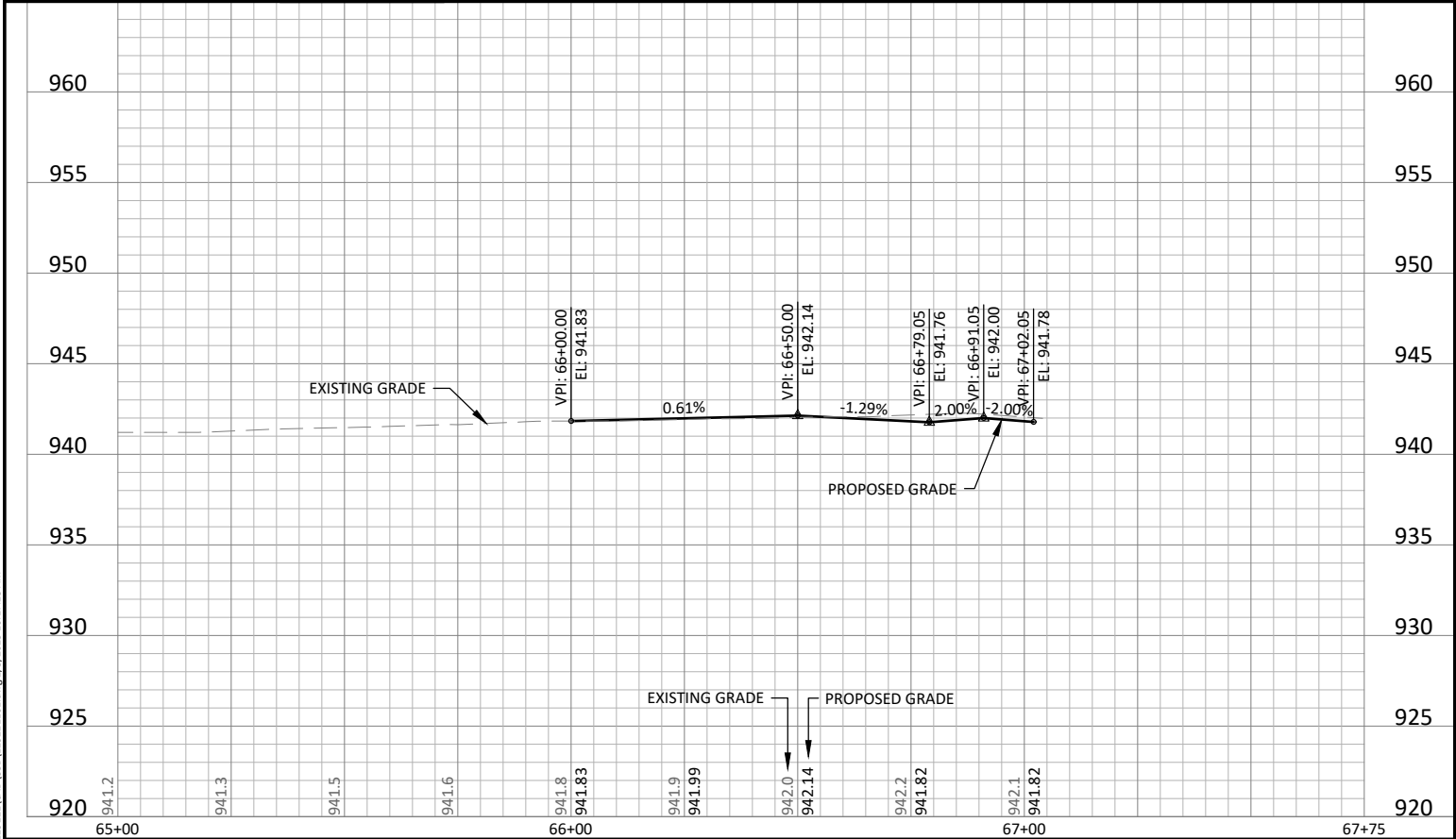
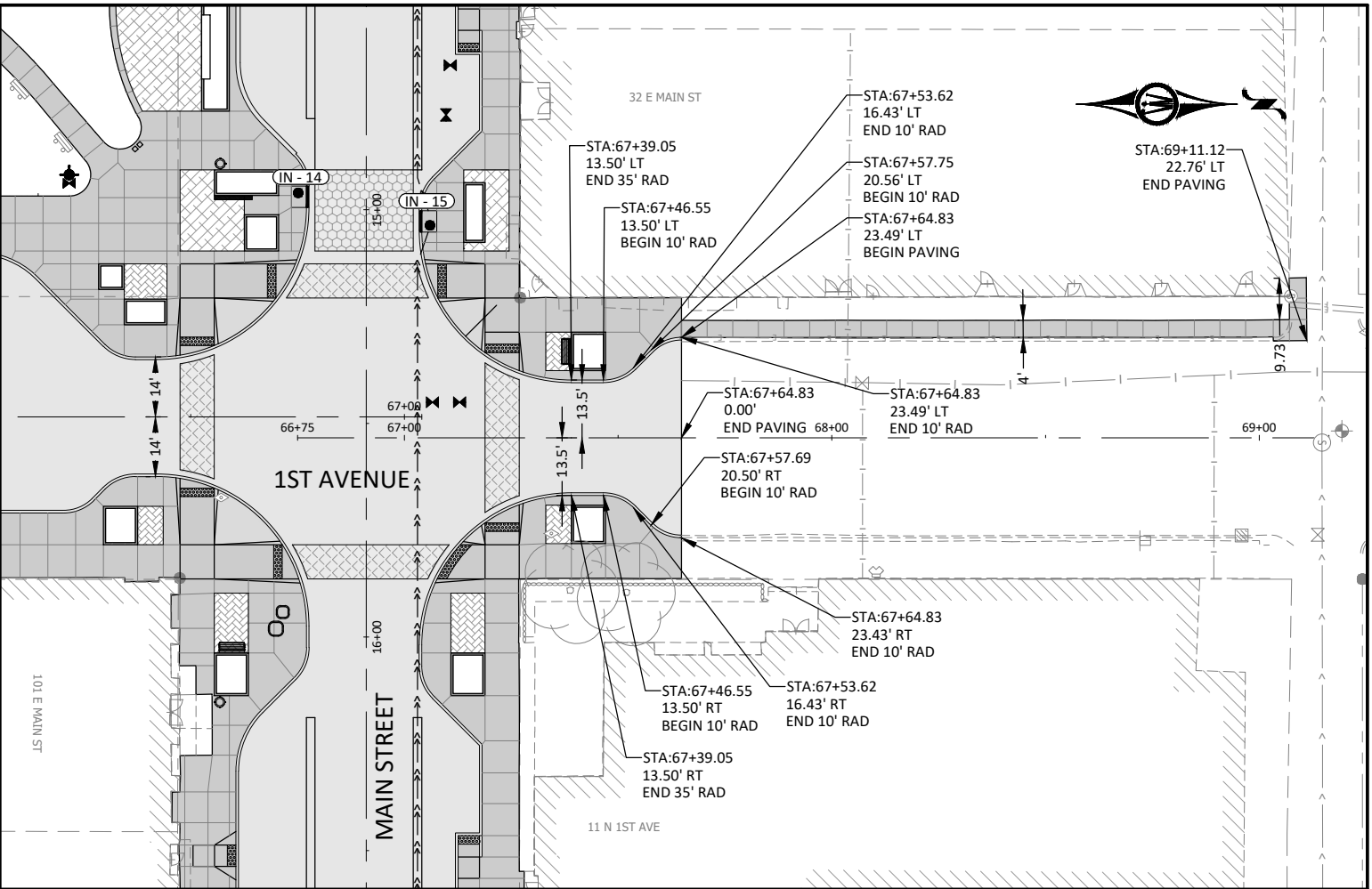
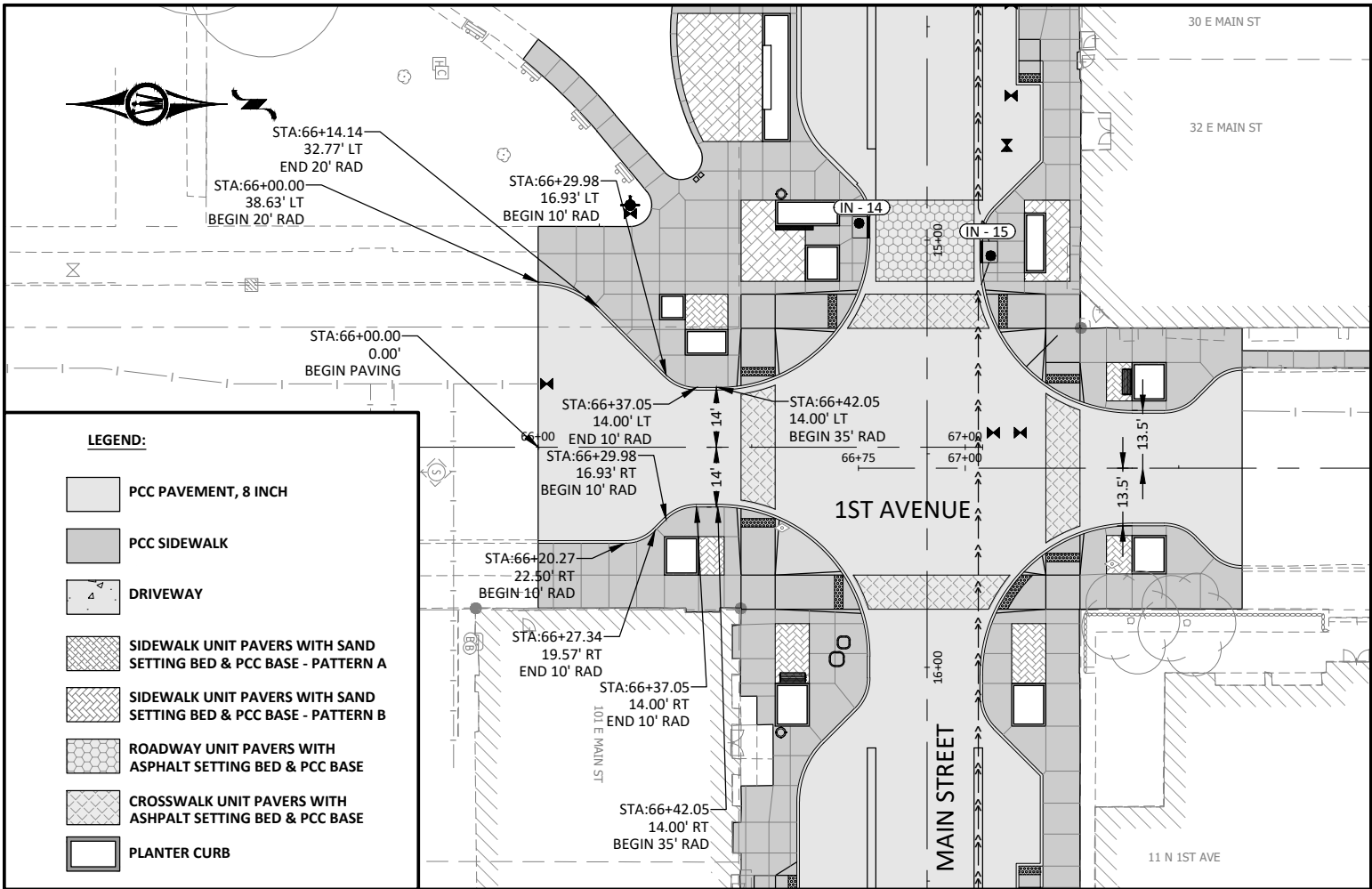
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DESIGNED	REV	DESCRIPTION	DATE
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
PLAN & PROFILE - CENTER STREET

SHEET
D.05

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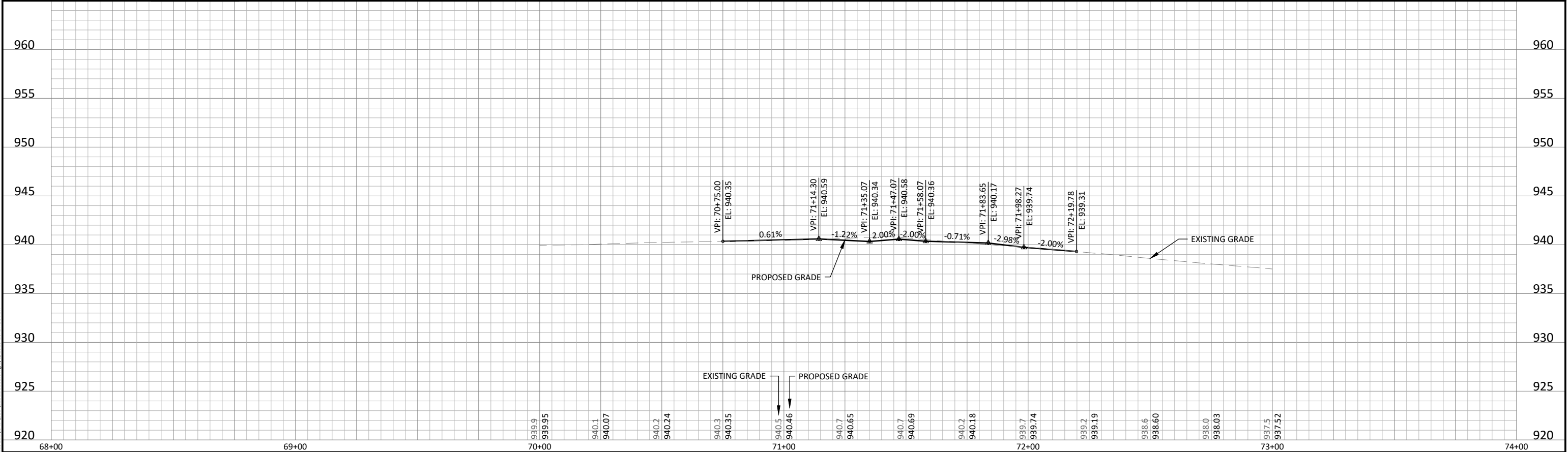
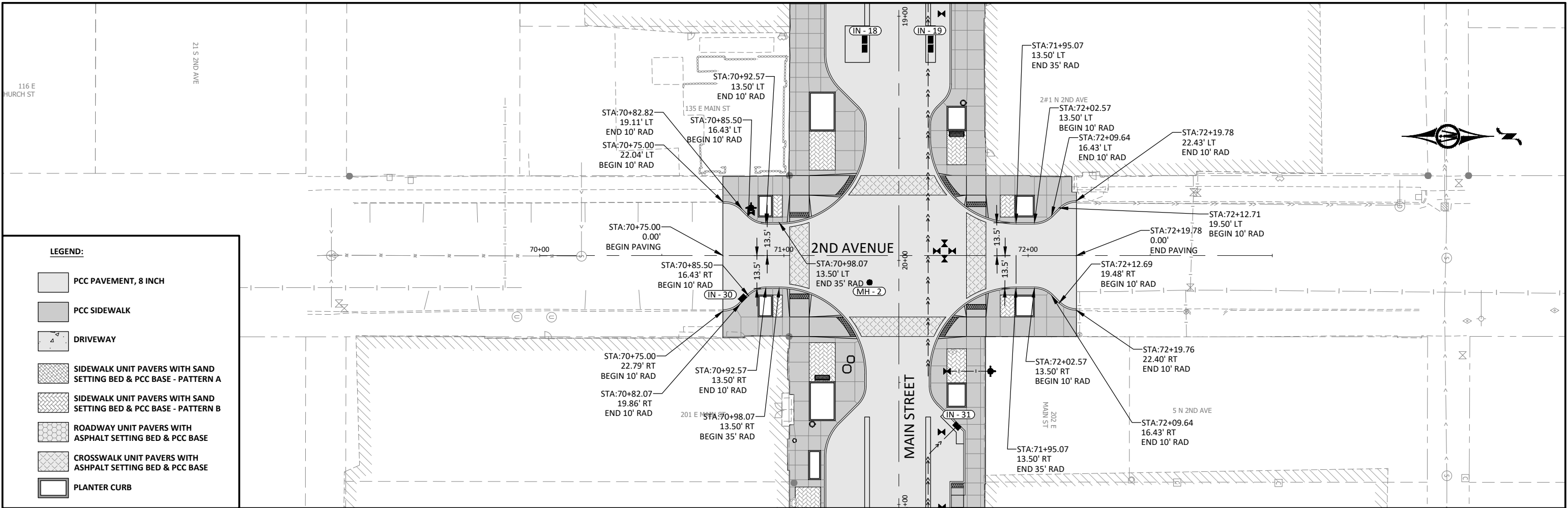


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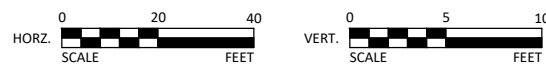
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
PLAN & PROFILE - 1ST AVENUE

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E.01



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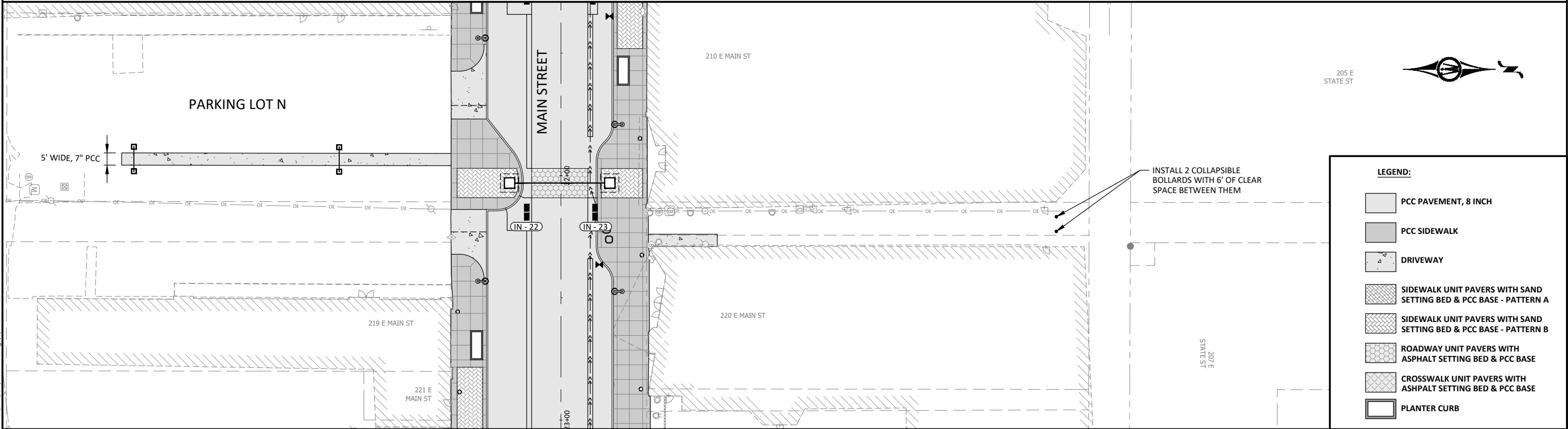
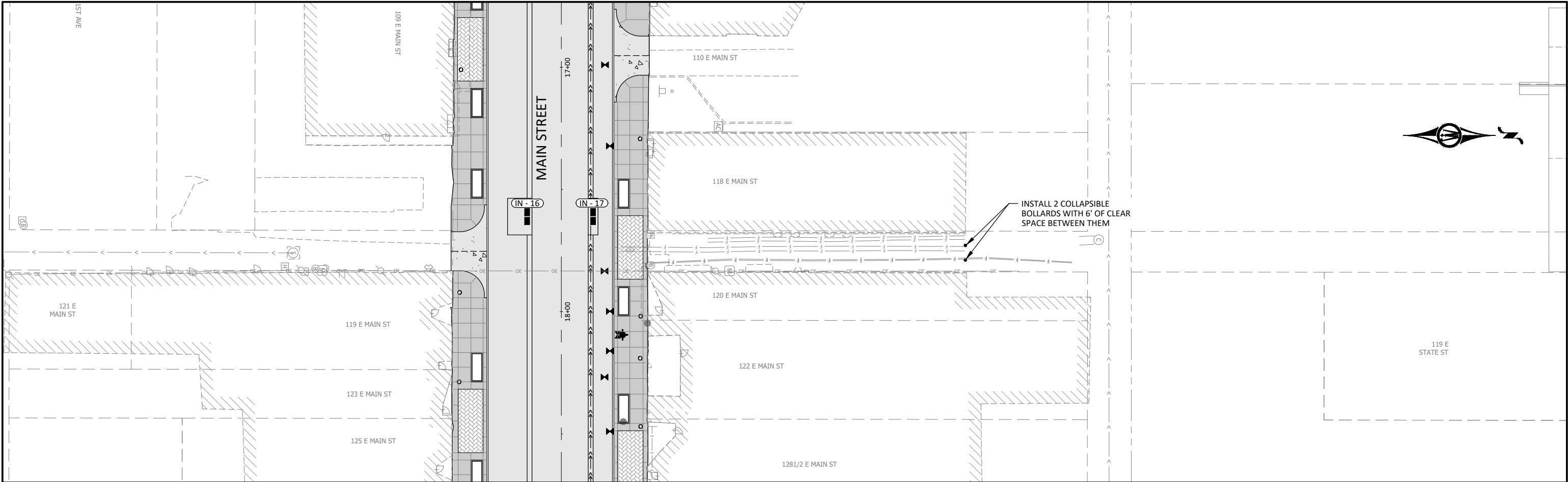


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PLAN & PROFILE - 2ND AVENUE

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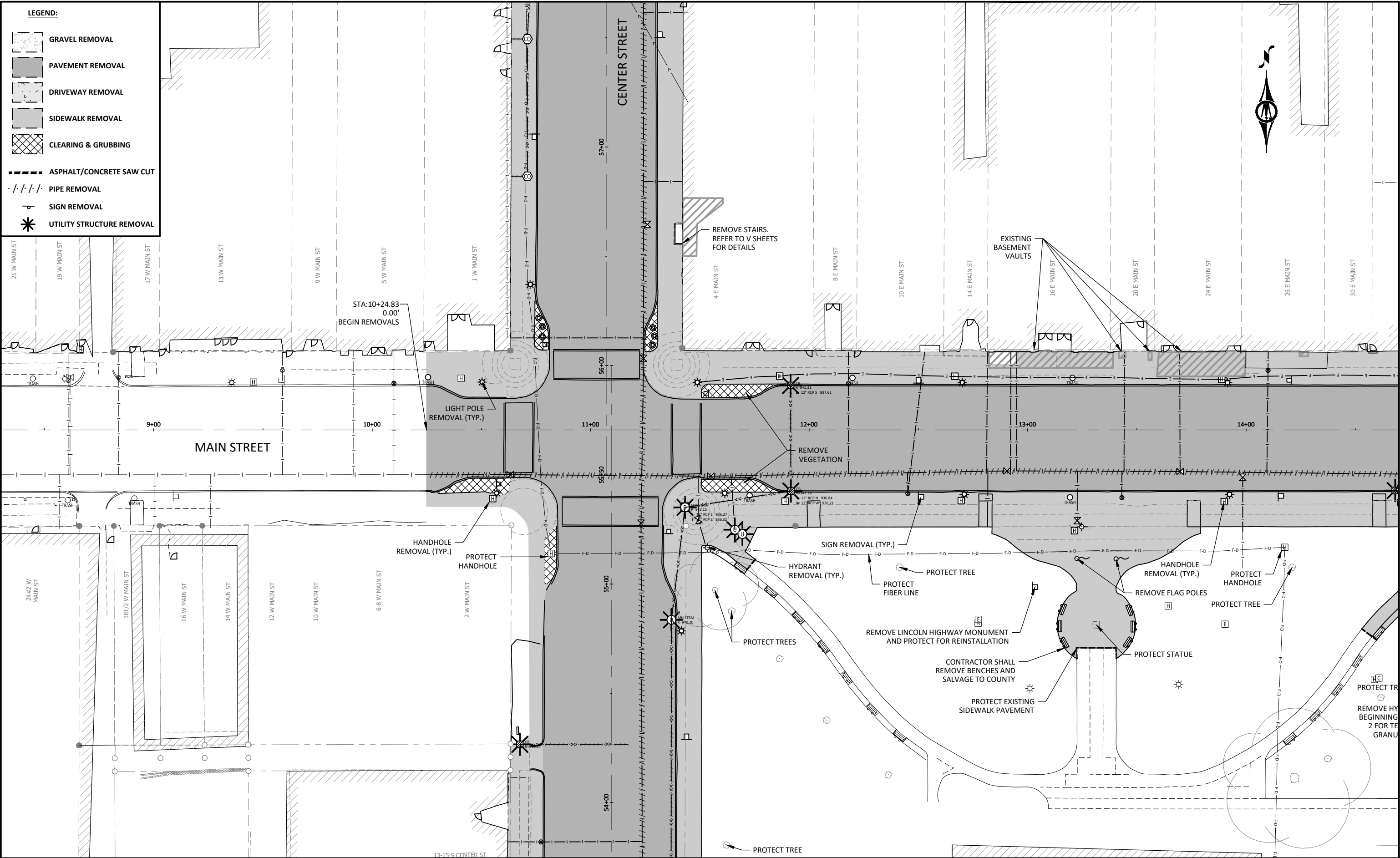
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

BOLLARD INSTALLATION LOCATIONS

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E.04

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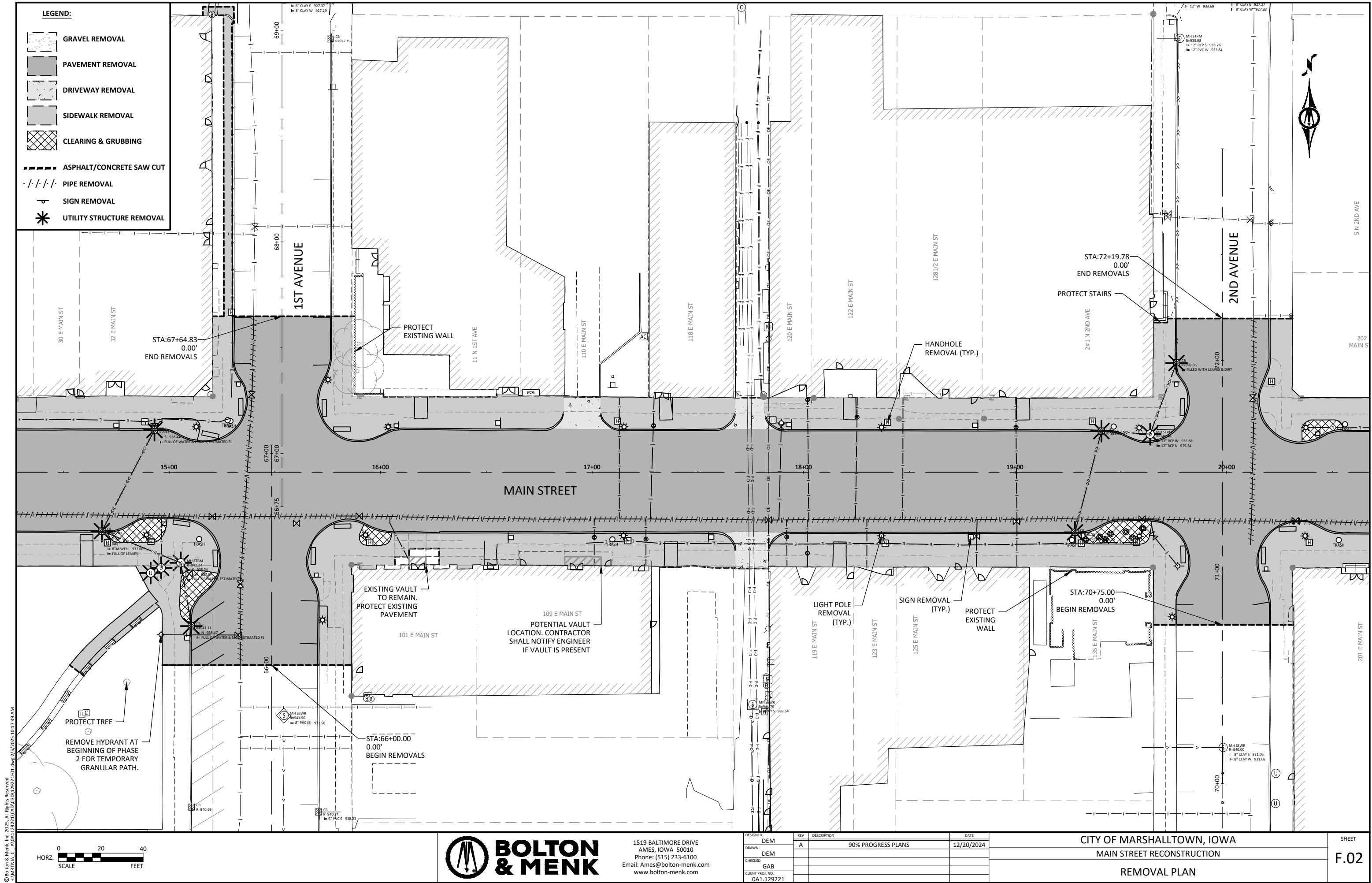
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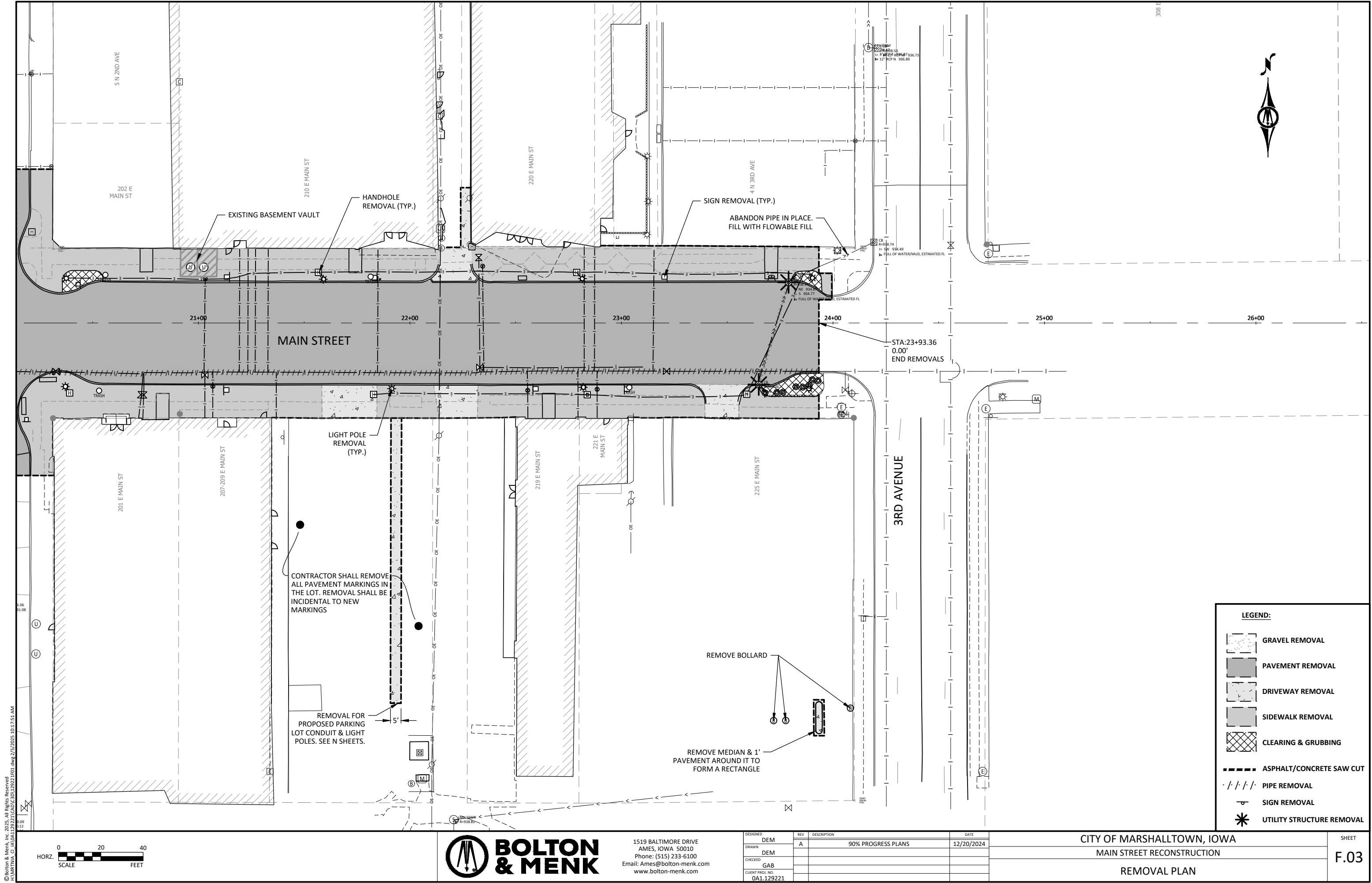
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

REMOVAL PLAN

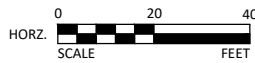
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F.01





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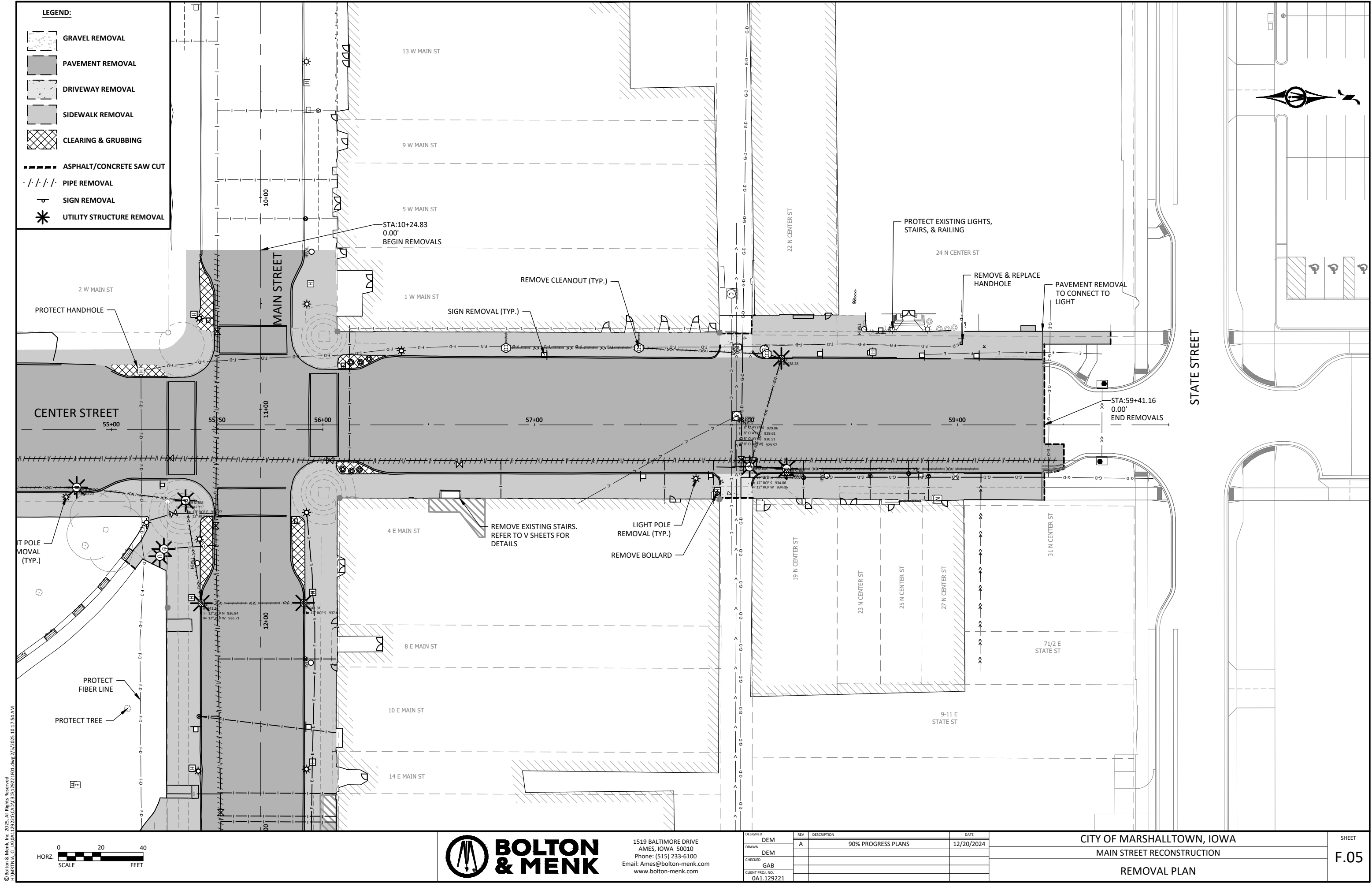
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MAIN STREET RECONSTRUCTION

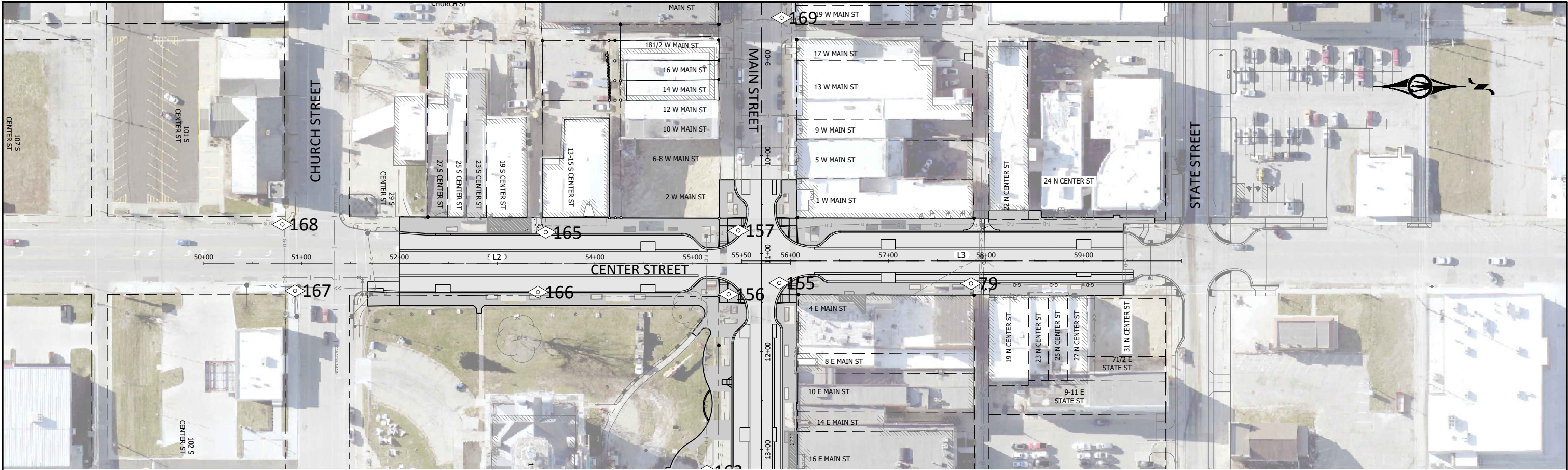
REMOVAL PLAN

SHEET

F.03



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129221 - MAIN STREET CL											
NUMBER	START STATION	END STATION	LENGTH	DELTA	RADIUS	CHORD	START NORTHING	START EASTING	END NORTHING	END EASTING	LINE / CHORD DIRECTION
L1	5+00	28+00	2,300.00'				7,855,567.46	19,473,243.52	7,855,567.33	19,475,543.52	S89° 59' 48"E
CENTER STREET SOUTH											
NUMBER	START STATION	END STATION	LENGTH	DELTA	RADIUS	CHORD	START NORTHING	START EASTING	END NORTHING	END EASTING	LINE / CHORD DIRECTION
L2	50+00	56+00	600.00'				7,854,996.91	19,473,853.13	7,855,596.91	19,473,853.16	N0° 00' 12"E
CENTER STREET NORTH											
NUMBER	START STATION	END STATION	LENGTH	DELTA	RADIUS	CHORD	START NORTHING	START EASTING	END NORTHING	END EASTING	LINE / CHORD DIRECTION
L3	55+50	60+00	450.00'				7,855,546.91	19,473,850.88	7,855,996.91	19,473,850.91	N0° 00' 12"E
1ST AVENUE SOUTH											
NUMBER	START STATION	END STATION	LENGTH	DELTA	RADIUS	CHORD	START NORTHING	START EASTING	END NORTHING	END EASTING	LINE / CHORD DIRECTION
L4	65+00	67+04.05	204.05'				7,855,376.35	19,474,291.97	7,855,580.40	19,474,291.99	N0° 00' 12"E
1ST AVENUE NORTH											
NUMBER	START STATION	END STATION	LENGTH	DELTA	RADIUS	CHORD	START NORTHING	START EASTING	END NORTHING	END EASTING	LINE / CHORD DIRECTION
L5	66+75	69+16.31	241.31'				7,855,551.35	19,474,296.88	7,855,792.66	19,474,296.90	N0° 00' 12"E
2ND AVENUE											
NUMBER	START STATION	END STATION	LENGTH	DELTA	RADIUS	CHORD	START NORTHING	START EASTING	END NORTHING	END EASTING	LINE / CHORD DIRECTION
L6	70+00	73+00	300.00'				7,855,420.31	19,474,741.53	7,855,720.31	19,474,741.55	N0° 00' 12"E

CONTROL POINT DATA				
POINT NUMBER	RAW DESCRIPTION	ELEVATION	NORTH	EAST
79	VFCP /CUT X BOC	939.490	7,855,781.52	19,473,874.17
151	VFCP /CUT X LP BASE	940.810	7,855,589.41	19,474,781.05
153	VFCP /CUT X LP BASE	941.928	7,855,610.71	19,474,319.30
154	VFCP /CUT X BOC	942.175	7,855,533.46	19,474,310.88
155	VFCP /CUT X BOC	942.219	7,855,585.34	19,473,873.57
156	VFCP /CUT X BOC	942.161	7,855,533.68	19,473,884.94
157	VFCP /CUT X BOC	942.211	7,855,543.67	19,473,820.02
158	VFCP /CUT X	941.111	7,855,595.54	19,474,518.10
159	VFCP /CUT X N SIDE MH	939.483	7,855,336.42	19,474,741.46
160	VFCP /CUT X EOCN	940.395	7,855,522.60	19,474,968.80
161	VFCP /CUT X LP BASE	940.056	7,855,525.22	19,475,148.65
162	VFCP /CUT X LP BASE	940.007	7,855,600.46	19,475,146.97
163	VFCP /CUT X	942.425	7,855,511.53	19,474,066.02
164	VFCP /CUT X W SIDE HYD	940.392	7,855,328.55	19,474,248.37
165	VFCP /CUT X BOC	937.959	7,855,346.74	19,473,821.75
166	VFCP /CUT X BOC	937.406	7,855,338.65	19,473,882.63
167	VFCP /CUT X BOC	931.209	7,855,090.40	19,473,881.42
168	VFCP /CUT X BOC	931.181	7,855,077.18	19,473,813.73
169	VFCP /CUT X BOC	940.621	7,855,587.71	19,473,602.56
170	VFCP /CUT X BOC	940.115	7,855,587.40	19,473,448.12

CONTROL POINT DATA				
POINT NUMBER	RAW DESCRIPTION	ELEVATION	NORTH	EAST
171	VFCP /CUT X TOP CONC OF ENTRANCE SIGN	940.752	7,855,787.94	19,475,224.63
173	VFBM /CUT X ON BOLT BELOW OP NUT	942.443	7,855,533.94	19,475,152.39

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CITY OF MARSHALLTOWN, IOWA

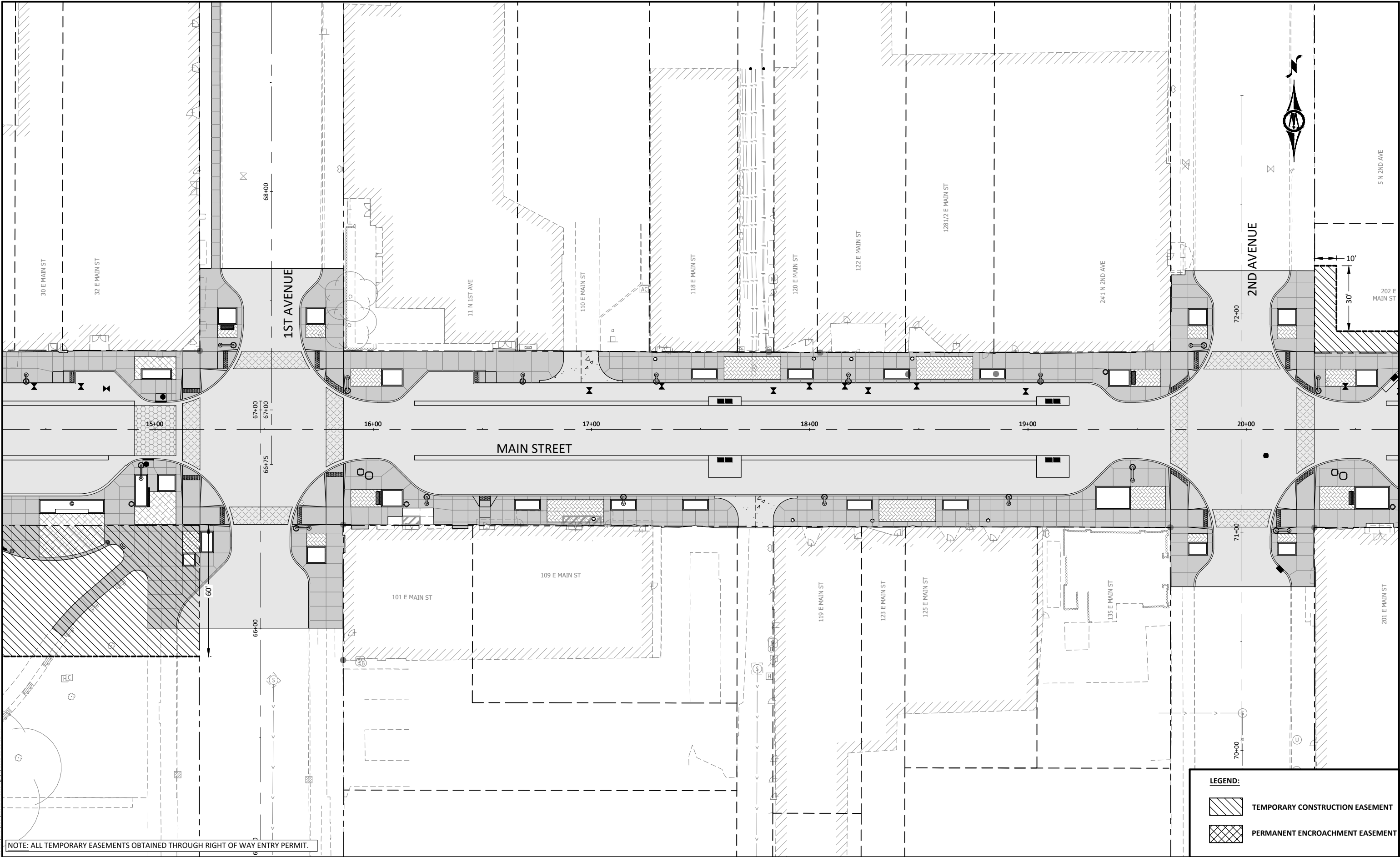
MAIN STREET RECONSTRUCTION

ALIGNMENT INFORMATION & CONTROL POINTS

SHEET

G.02

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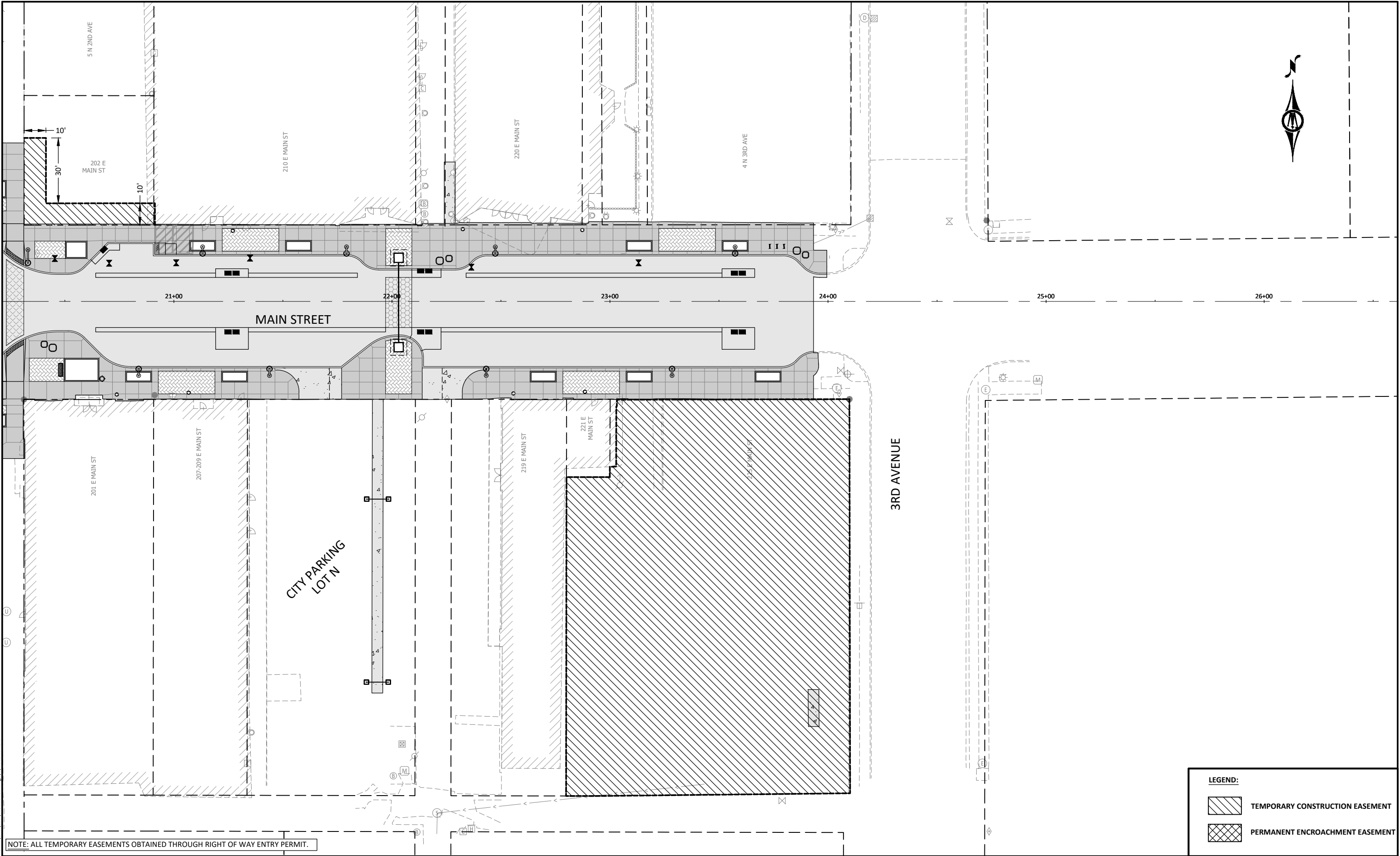
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
RIGHT-OF-WAY SHEETS

SHEET
H.02

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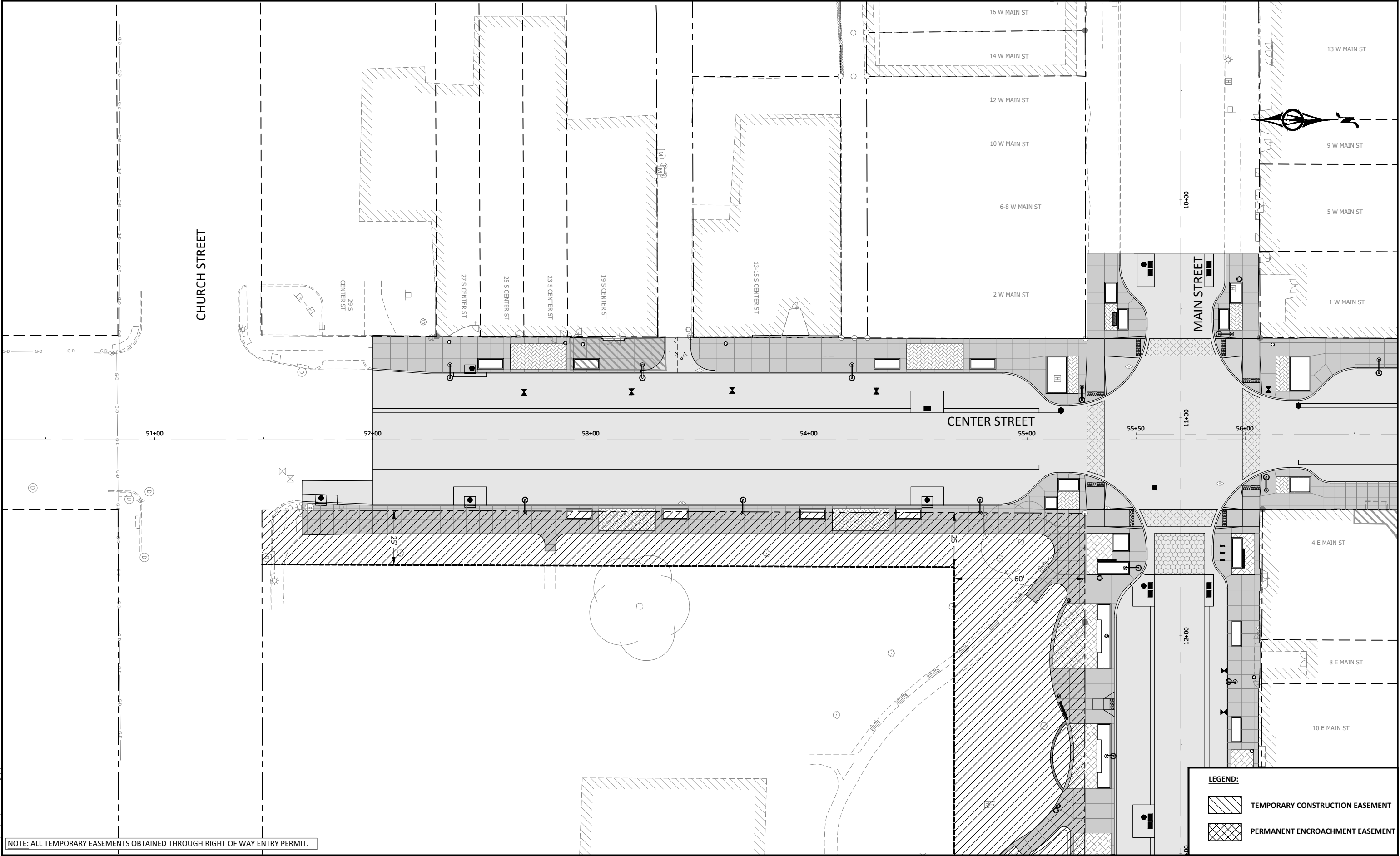
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MAIN STREET RECONSTRUCTION	
RIGHT-OF-WAY SHEETS	

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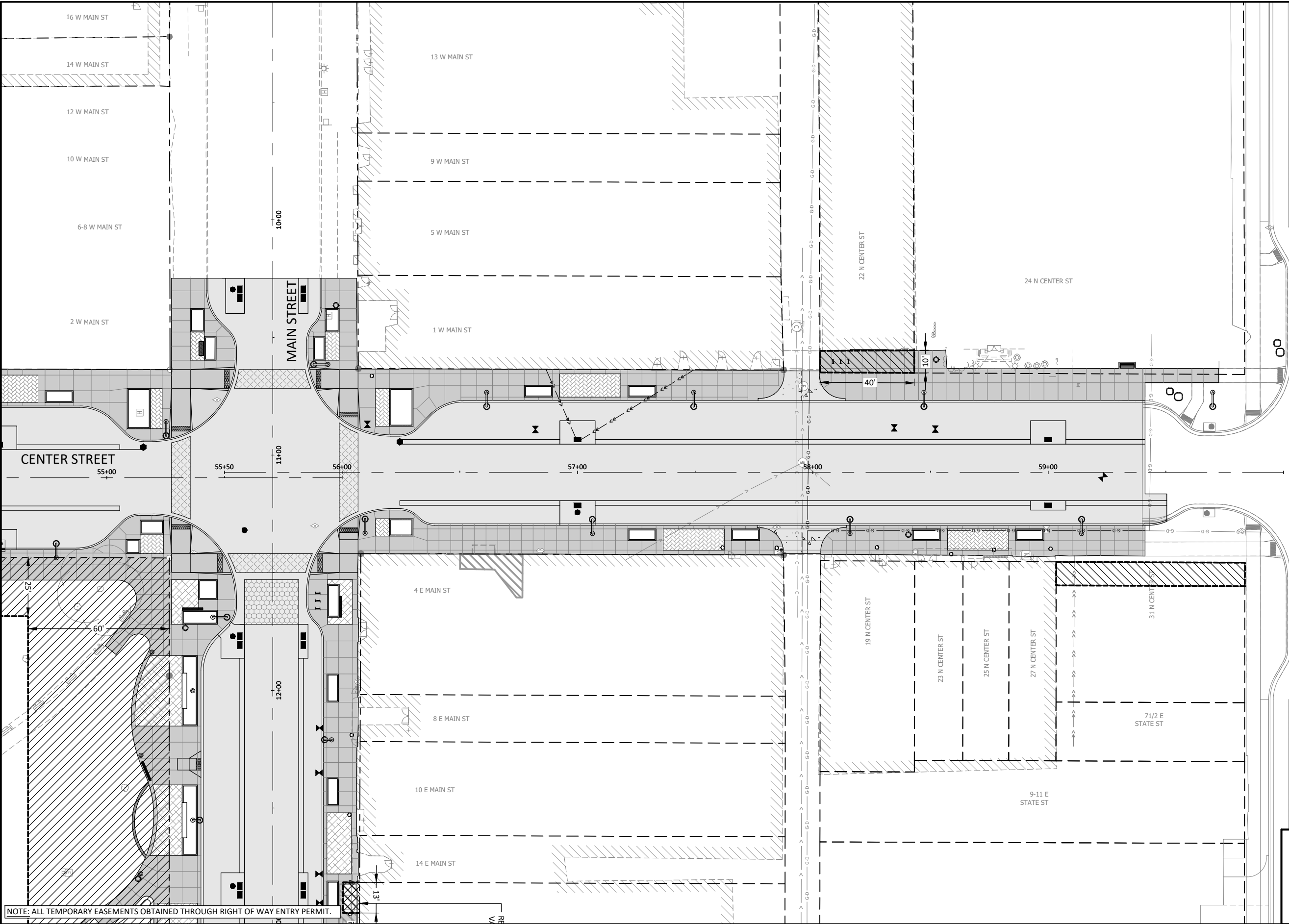
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

RIGHT-OF-WAY SHEETS

SHEET

H.04

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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
RIGHT-OF-WAY SHEETS

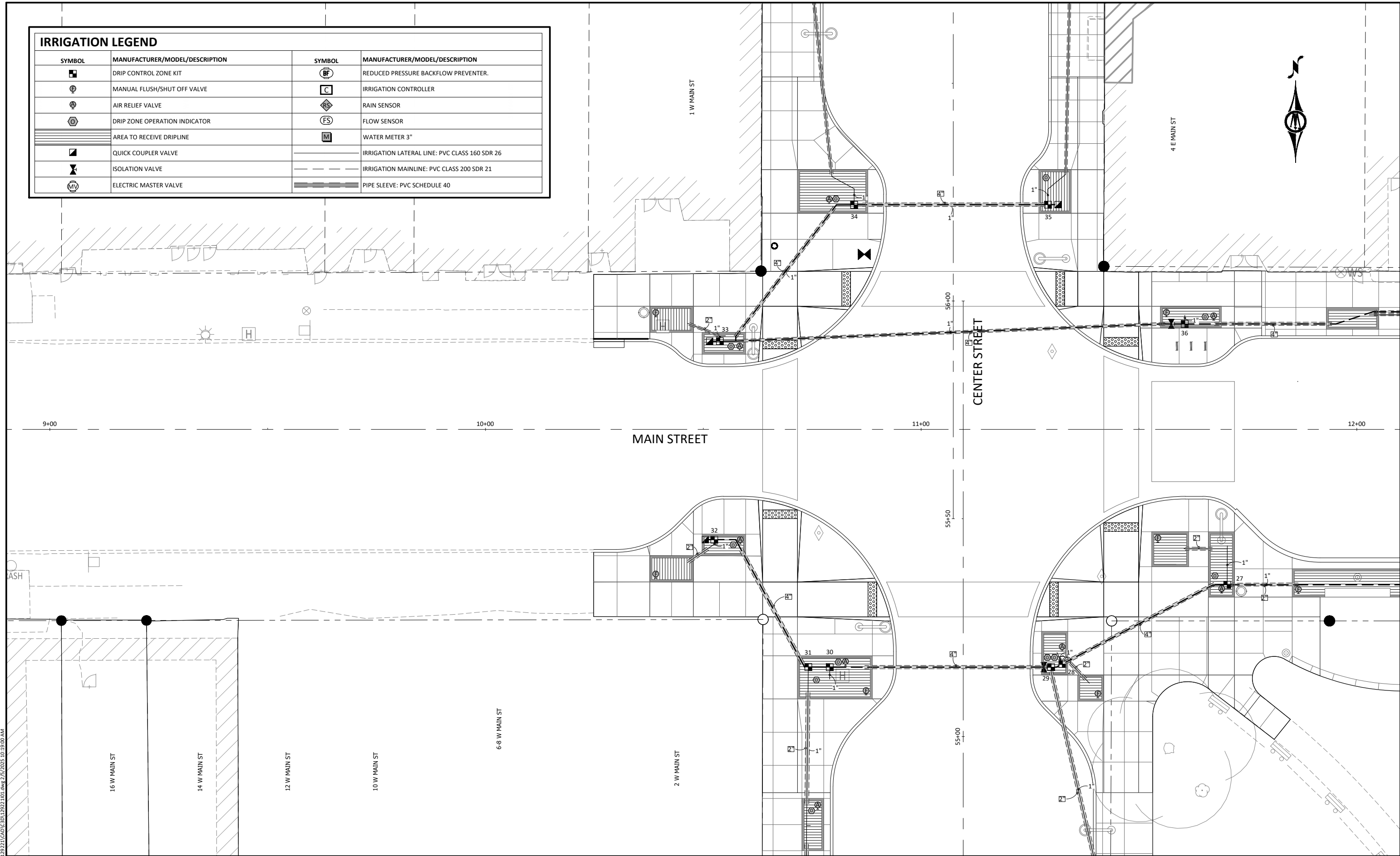
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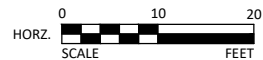
LEGEND:

-  TEMPORARY CONSTRUCTION EASEMENT
-  PERMANENT ENCROACHMENT EASEMENT

IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER.
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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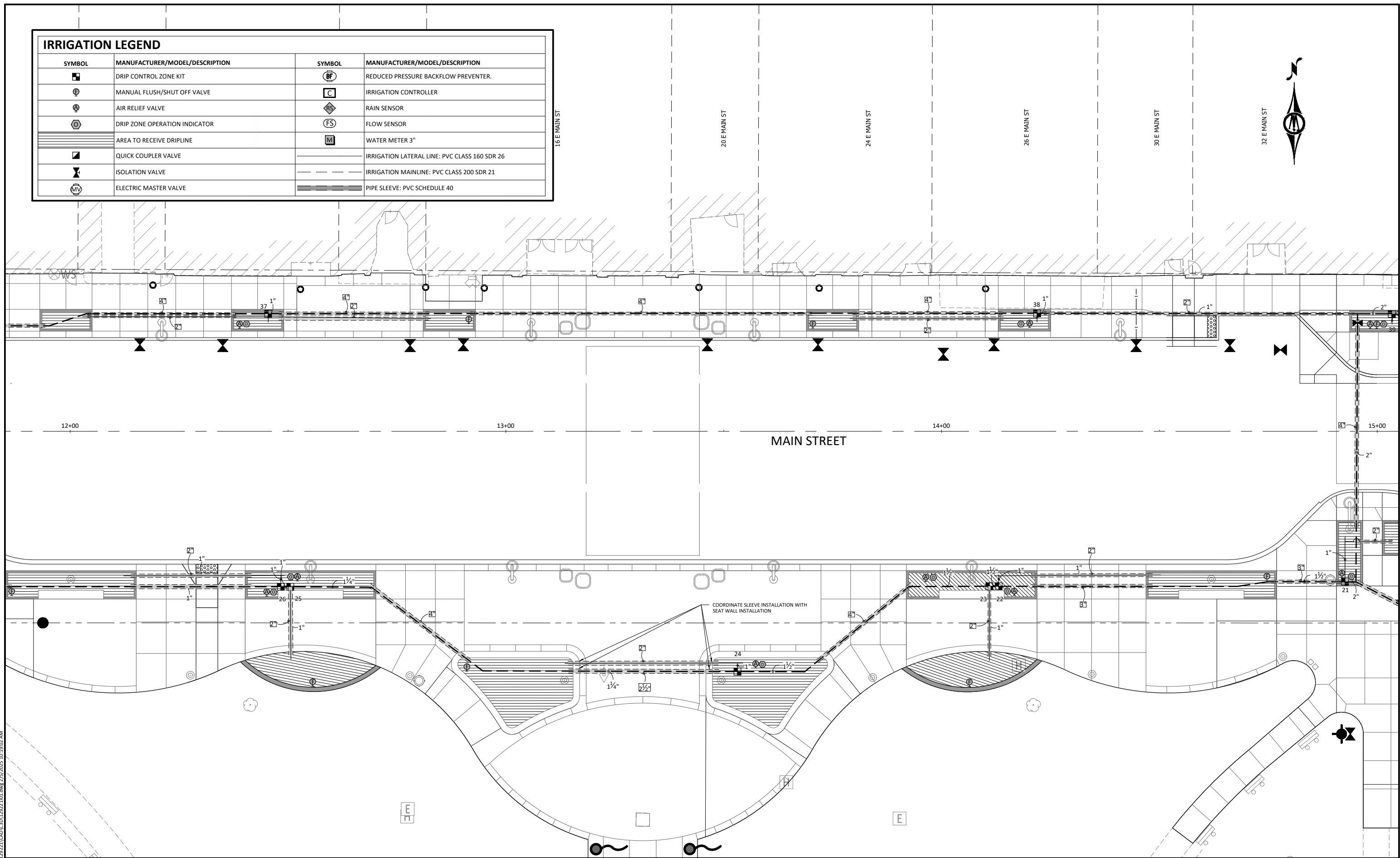
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
IRRIGATION PLAN

SHEET
1.01

IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER.
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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HORIZ. SCALE FEET



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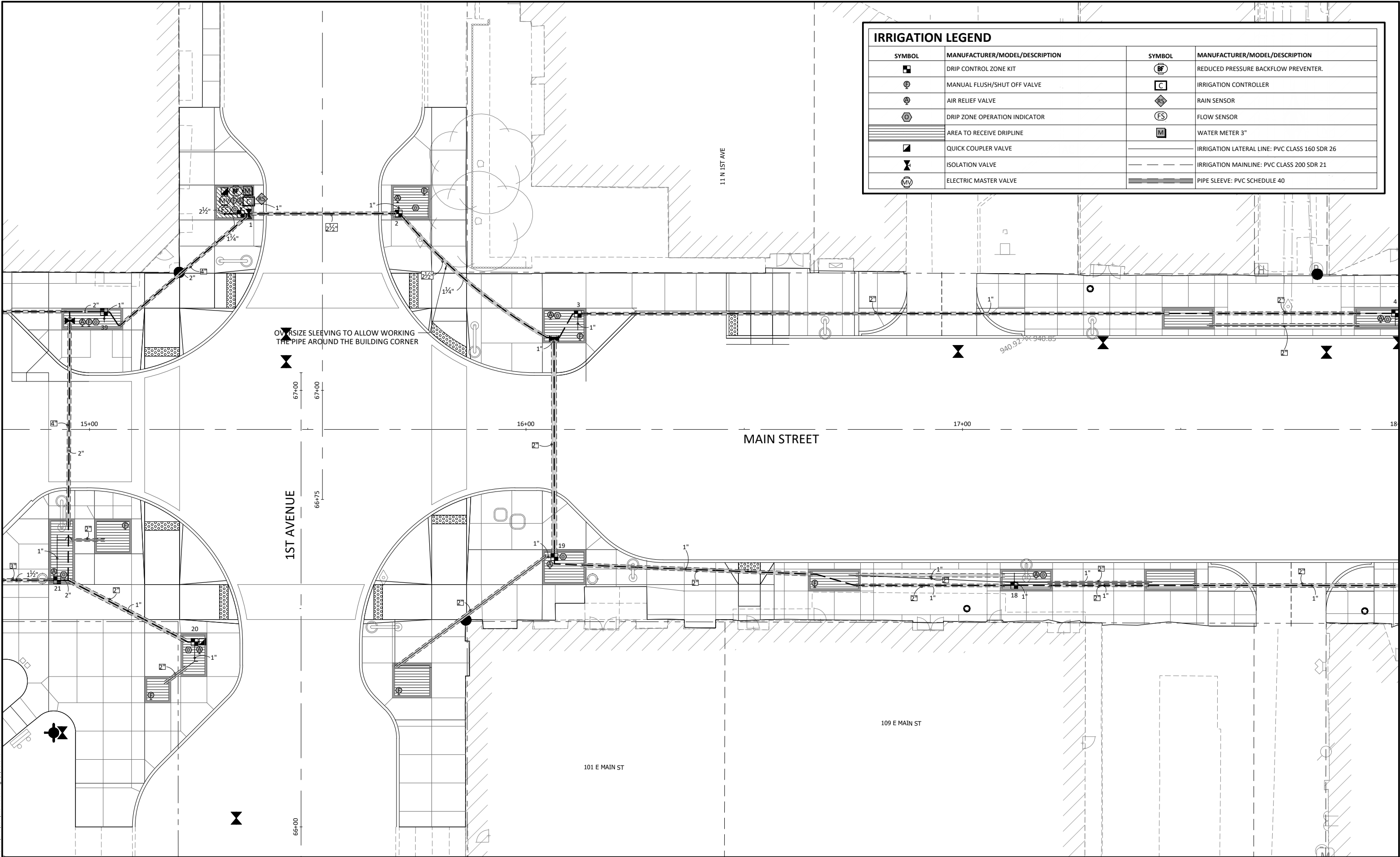
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

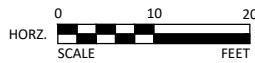
IRRIGATION PLAN

SHEET
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IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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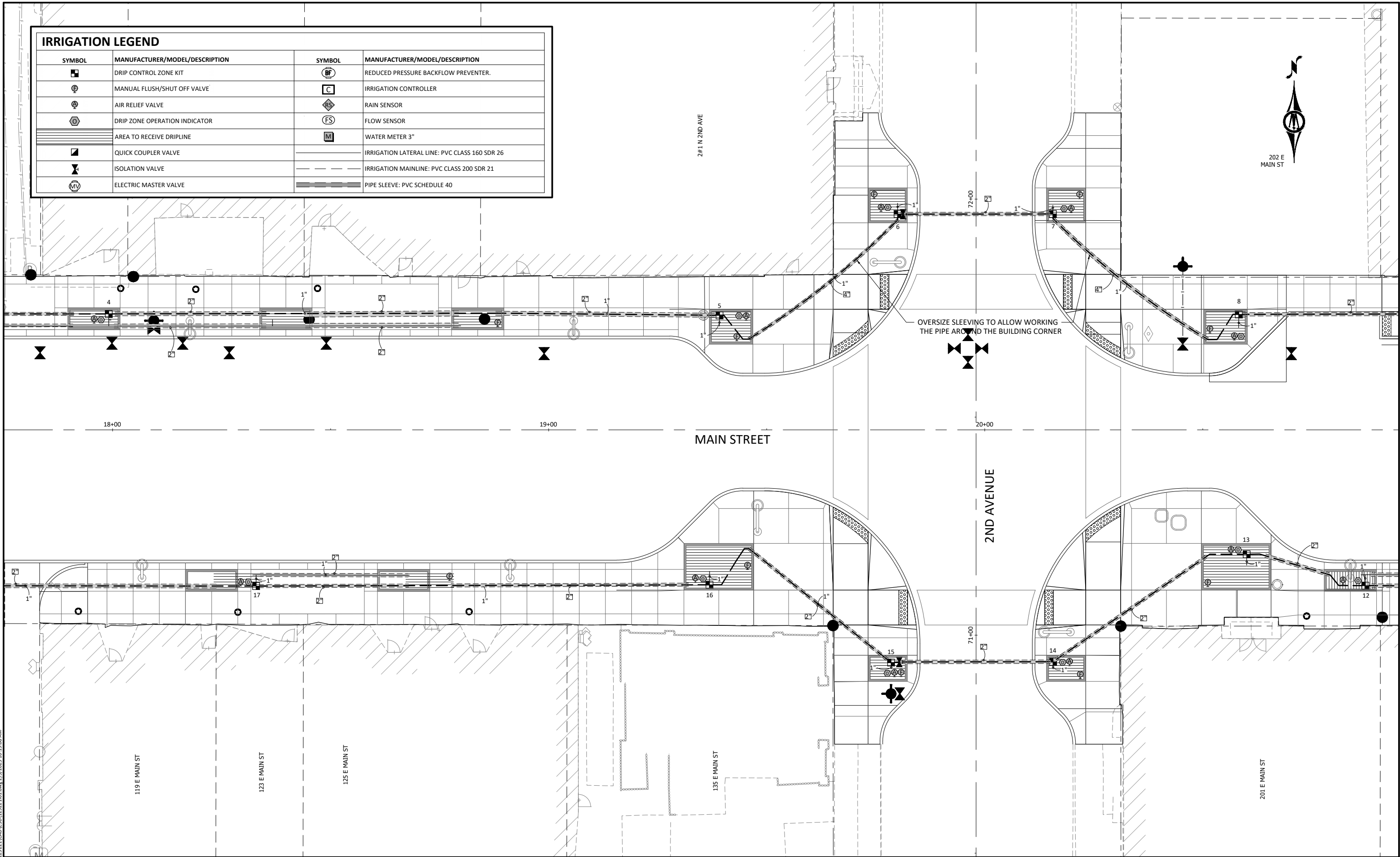
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

IRRIGATION PLAN

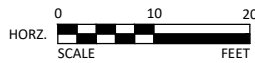
SHEET

1.03

IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER.
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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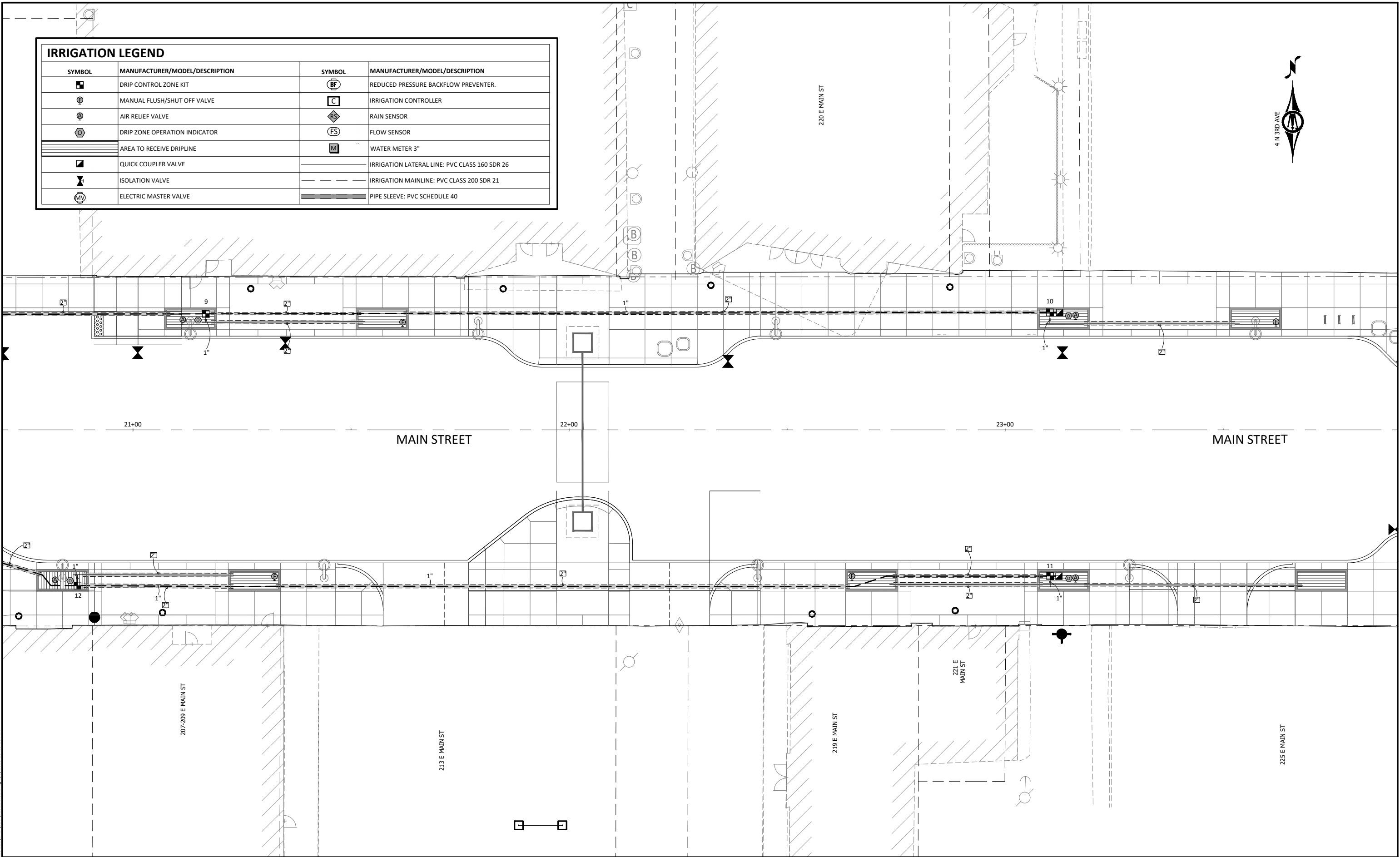
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

IRRIGATION PLAN

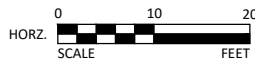
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1.04

IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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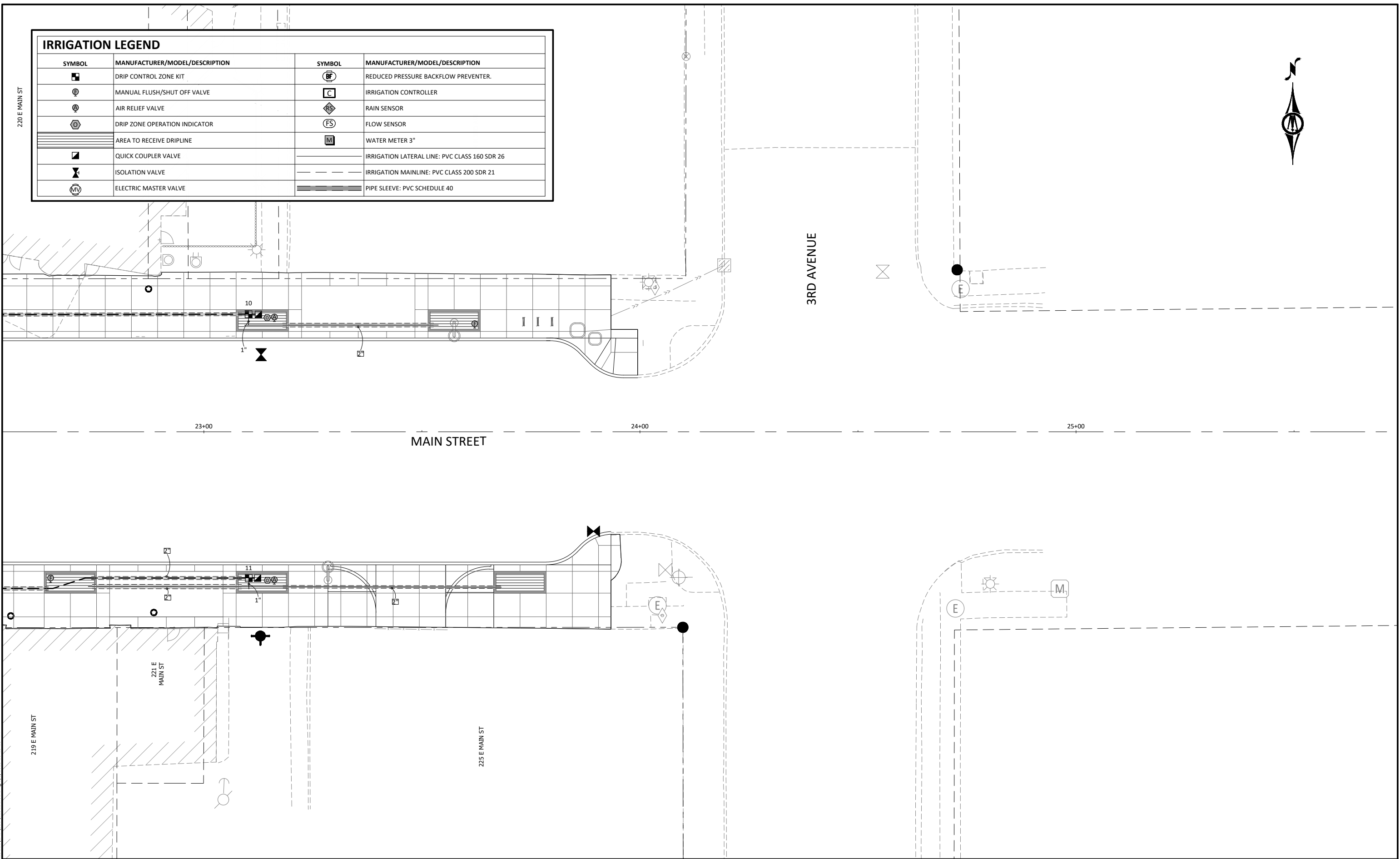
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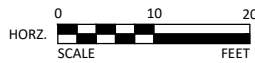
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
IRRIGATION PLAN

SHEET
1.05

IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER.
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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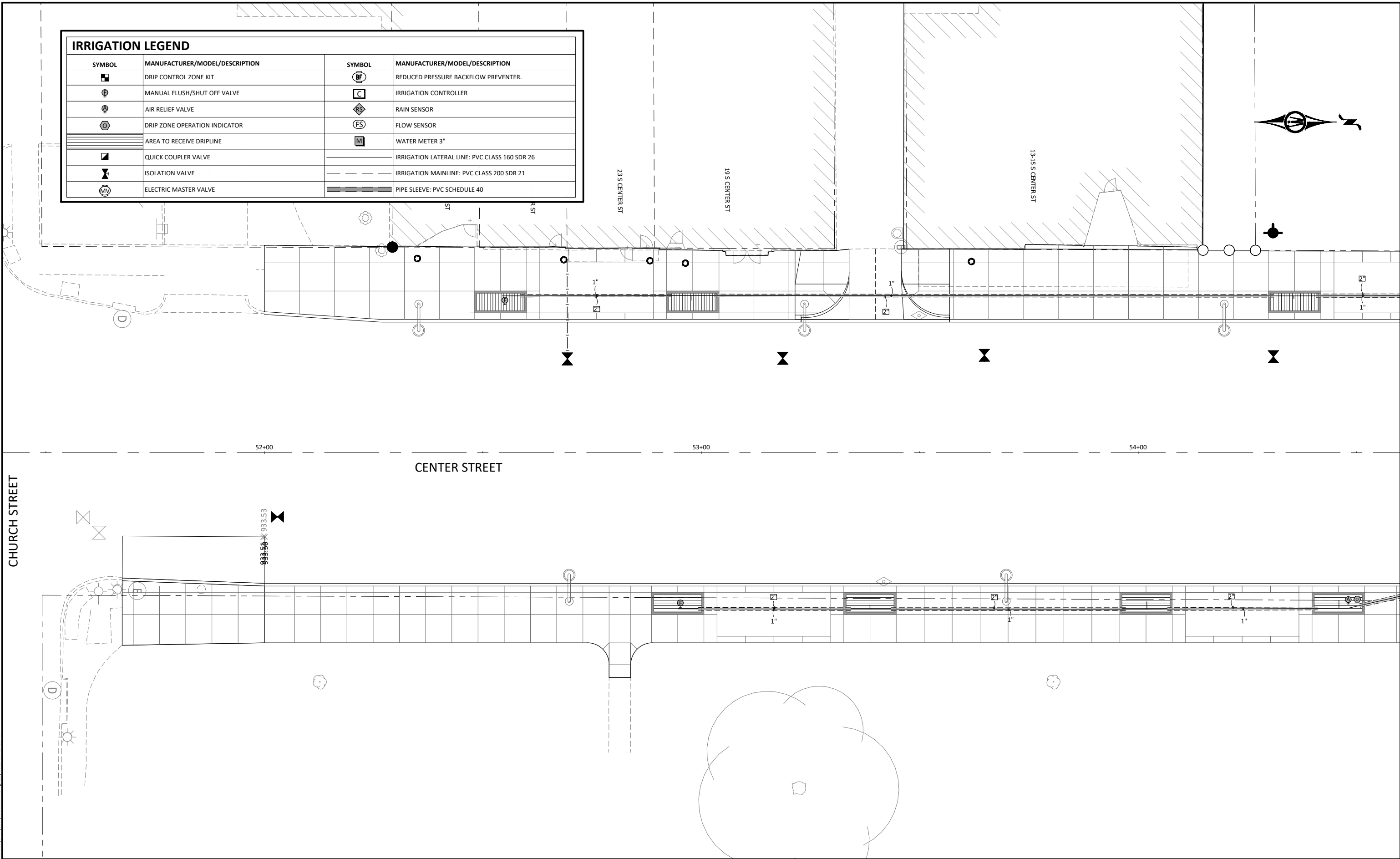
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IRRIGATION PLAN

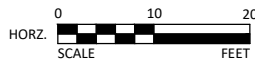
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IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER.
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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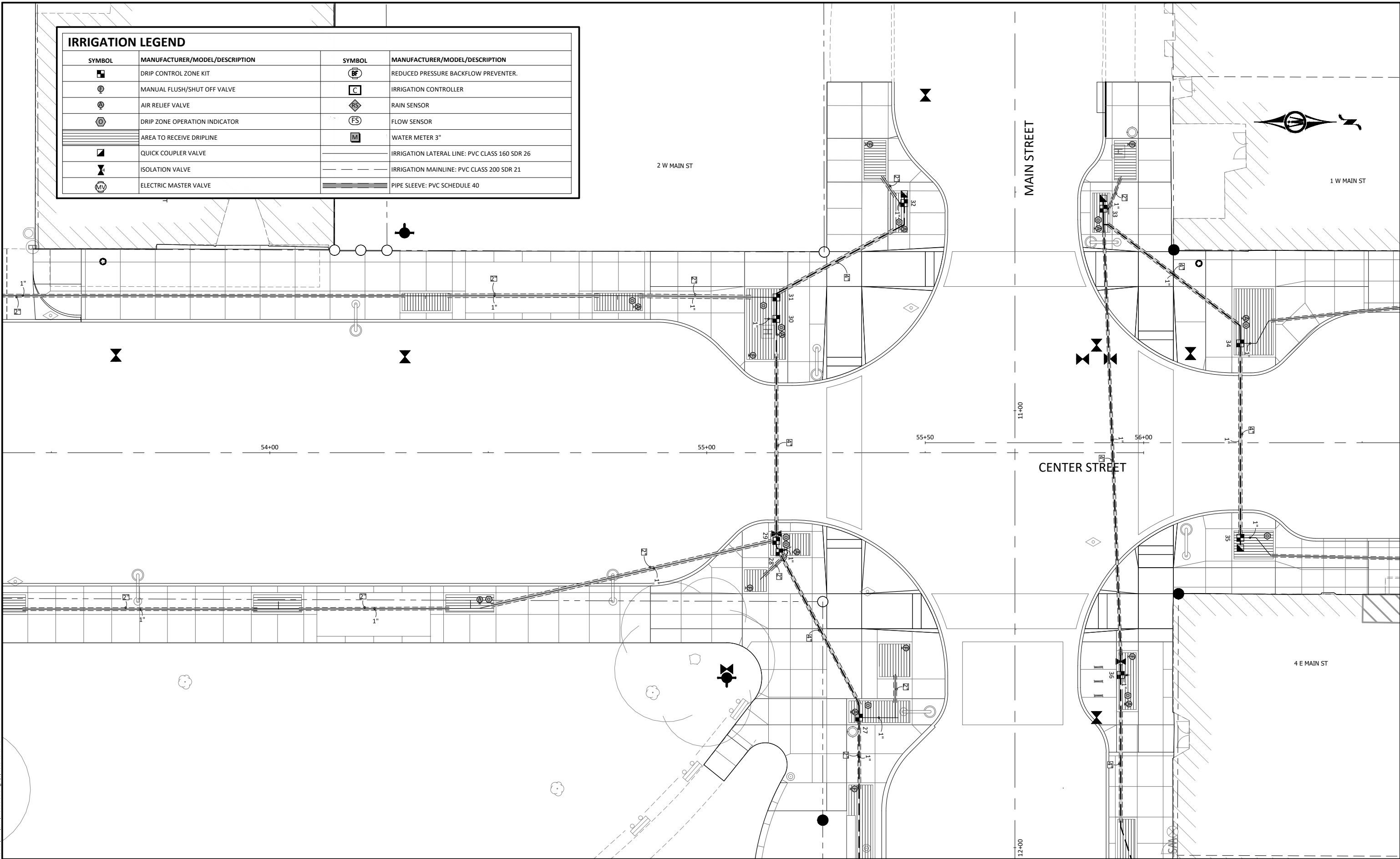
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

IRRIGATION PLAN

SHEET

1.07

IRRIGATION LEGEND			
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER.
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

IRRIGATION PLAN

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S W MAIN ST

22 N CENTER ST

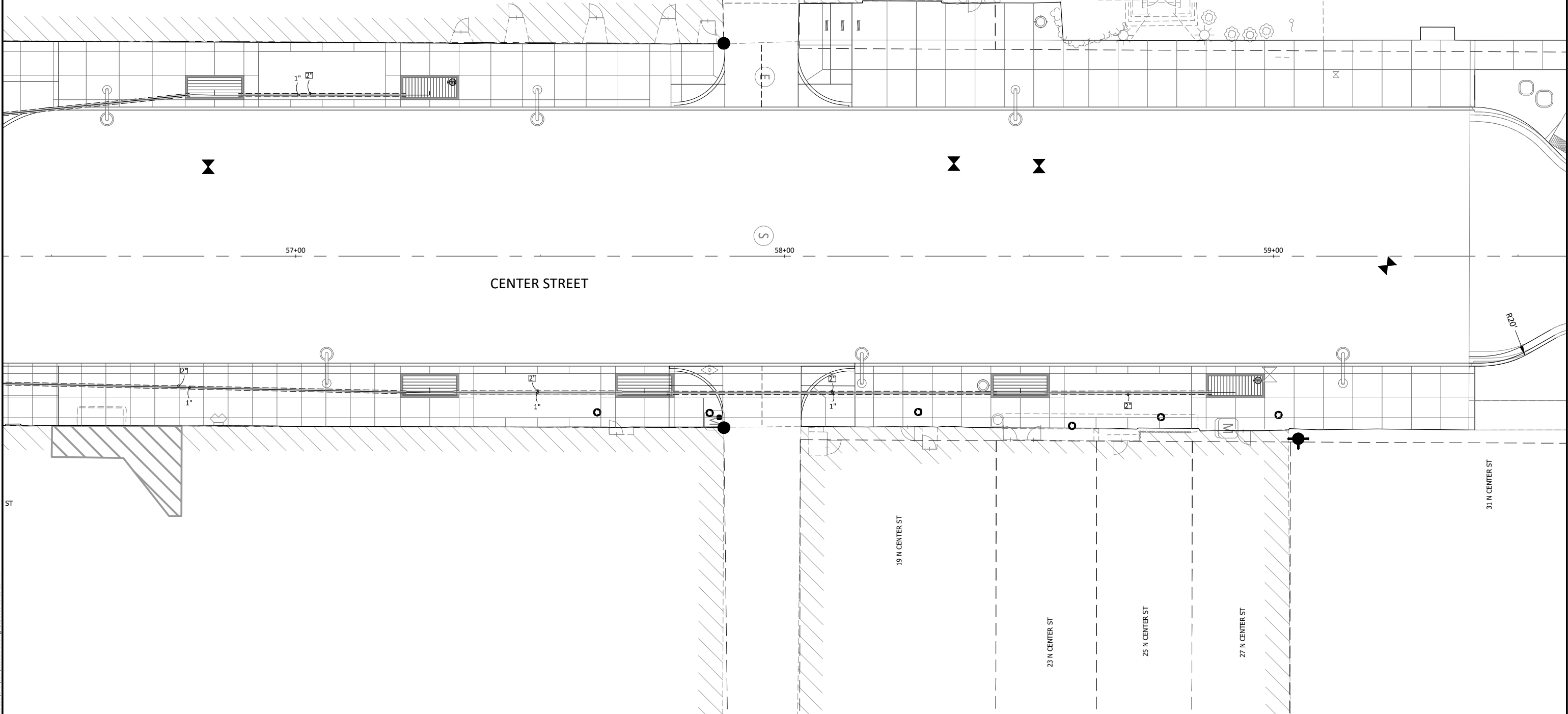
24 N CENTER ST



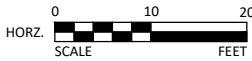
IRRIGATION LEGEND

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	DRIP CONTROL ZONE KIT		REDUCED PRESSURE BACKFLOW PREVENTER.
	MANUAL FLUSH/SHUT OFF VALVE		IRRIGATION CONTROLLER
	AIR RELIEF VALVE		RAIN SENSOR
	DRIP ZONE OPERATION INDICATOR		FLOW SENSOR
	AREA TO RECEIVE DRIPLINE		WATER METER 3"
	QUICK COUPLER VALVE		IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26
	ISOLATION VALVE		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	ELECTRIC MASTER VALVE		PIPE SLEEVE: PVC SCHEDULE 40

1 V



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
IRRIGATION PLAN

SHEET

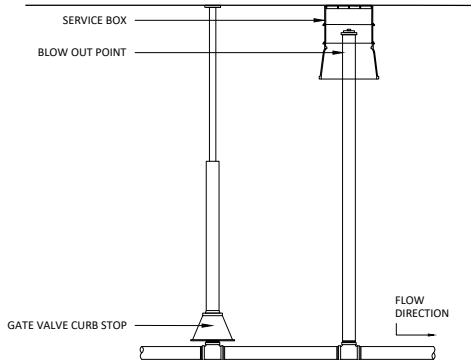
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SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	HUNTER ICZ-101-40 1" DRIP CONTROL ZONE KIT. 1IN. ICV GLOBE VALVE WITH 1IN. HY100 FILTER SYSTEM. PRESSURE REGULATION: 40PSI. FLOW RANGE: 2 GPM TO 20 GPM. 150 MESH STAINLESS STEEL SCREEN.	39
	HUNTER PLD-BV MANUAL FLUSH/SHUT OFF VALVE, BARBED INSERT. TYPICALLY INSTALLED IN 10IN. BOX, WITH ADEQUATE BLACK TUBING TO EXTEND VALVE OUT OF VALVE BOX. USE WITH HDL OR OTHER 3/4IN. DRIPLINE.	39
	HUNTER PLD-AVR 3/4" PLD-AVR ALLOWS FOR AIR TO ESCAPE A DRIP IRRIGATION SYSTEM TO PREVENT BLOCKAGE AND WATER HAMMERING. 1/2IN. MPT CONNECTION WITH 80 PSI MAXIMUM RATING.	38
	HUNTER ECO-ID-12 ECO-ID: 1/2IN. FPT CONNECTION WITH 15 PSI - 100 PSI OPERATING PRESSURE. SPECIFY WITH HUNTER SJ WING JOINT.	41
	AREA TO RECEIVE DRIPLINE HUNTER HDL-09-12-PC HDL-09-12-PC: HUNTER DRIPLINE WITH 0.9 GPH FLOW, LIGHT BROWN TUBING WITH BLACK STRIPING. EMITTERS AT 12\" O.C. DRIPLINE LATERALS SPACED AT 12\" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. INSTALL WITH HUNTER PLD BARBED OR PLD-LOC FITTINGS.	4,976 SF

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	HUNTER HQ-33DR3 3/4"	7
	LEEMCO LBT-SS 1IN.-4IN. (FPT X FPT) STAINLESS STEEL BALL VALVE	7
	HUNTER IBV-DC 2" 2IN. BRASS ELECTRIC MASTER VALVE, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE. WITH DC LATCHING SOLENOID FACTORY INSTALLED OPTION.	1
	ZURN 975 3" REDUCED PRESSURE BACKFLOW PREVENTER.	1
	HUNTER A2C-150D-M 150-STATION DECODER CONTROLLER WITH ONE (1) A2C-D75 MODULE IN AN OUTDOOR METAL WALL MOUNT ENCLOSURE.	1
	HUNTER RAIN-CLIK RAIN SENSOR, WITH CONDUIT INSTALLATION, MOUNT AS NOTED. NORMALLY CLOSED SWITCH.	1
	HUNTER HFS-200 FLOW SENSOR FOR USE WITH ACC CONTROLLER, 2IN. SCHEDULE 40 SENSOR BODY, 24 VAC, 2 AMP.	1
	WATER METER 3"	1
	IRRIGATION LATERAL LINE: PVC CLASS 160 SDR 26 1"	1,785 LF
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 1"	2,312 LF
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 1 1/4"	192.1 LF
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 1 1/2"	146.5 LF
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 2"	116.1 LF
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 2 1/2"	10.5 LF
	PIPE SLEEVE: PVC SCHEDULE 40	77.1 LF
	PIPE SLEEVE: PVC SCHEDULE 40 2"	2,689 LF
	PIPE SLEEVE: PVC SCHEDULE 40 2 1/2"	107.0 LF
	PIPE SLEEVE: PVC SCHEDULE 40 3"	43.8 LF
	PIPE SLEEVE: PVC SCHEDULE 40 4"	636.8 LF

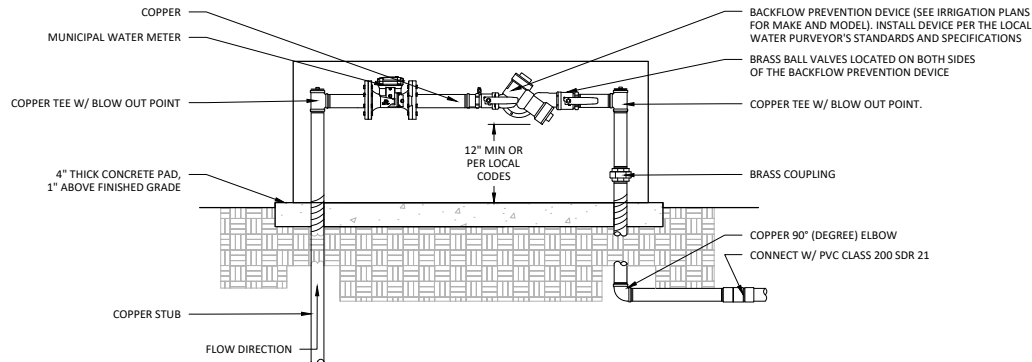
NUMBER	MODEL	SIZE	TYPE	GPM	PSI	PSI @ POC	PRECIP
1	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.84	18.0	36.1	1.44 in/h
2	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.84	18.0	37.1	1.44 in/h
3	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.95	18.0	38.2	1.44 in/h
4	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.64	18.4	41.0	1.44 in/h
5	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.95	18.0	41.4	1.44 in/h
6	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.84	18.0	41.7	1.44 in/h
7	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.84	18.0	41.8	1.44 in/h
8	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.95	18.0	41.9	1.44 in/h
9	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.32	18.0	42.0	1.44 in/h
10	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.32	18.0	42.1	1.44 in/h
11	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.98	18.0	46.5	1.44 in/h
12	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.32	18.0	46.3	1.44 in/h
13	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.19	18.1	46.3	1.45 in/h
14	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.6	18.0	46.0	1.44 in/h
15	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.6	18.0	45.7	1.44 in/h
16	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.19	18.1	45.5	1.45 in/h
17	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.32	18.0	44.1	1.45 in/h
18	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.0	18.0	42.1	1.45 in/h
19	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.79	18.0	39.7	1.44 in/h
20	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.05	18.0	37.2	1.44 in/h
21	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.85	18.0	37.2	1.45 in/h
22	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	4.02	19.4	40.5	1.44 in/h
23	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.49	18.3	39.5	1.44 in/h
24	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	8.61	22.3	44.5	1.44 in/h
25	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.48	18.3	42.2	1.44 in/h
26	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	4.02	19.4	43.3	1.44 in/h
27	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.85	18.0	43.7	1.45 in/h
28	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.05	18.0	44.3	1.44 in/h
29	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.64	18.6	44.9	1.44 in/h
30	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.6	18.4	45.1	1.45 in/h
31	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.64	18.6	45.3	1.44 in/h
32	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.22	18.0	44.8	1.44 in/h
33	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.22	18.0	40.1	1.44 in/h
34	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.32	18.0	40.2	1.44 in/h
35	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	2.64	18.6	40.9	1.44 in/h
36	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	0.78	18.0	39.6	1.44 in/h
37	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.49	18.0	39.1	1.44 in/h
38	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.16	18.0	37.5	1.44 in/h
39	HUNTER ICZ-101-40	1"	AREA FOR DRIFLINE	1.05	18.0	36.6	1.44 in/h

3. FIELD VERIFY SITE CONDITIONS AND LOCATE UNDERGROUND UTILITIES PRIOR TO TRENCHING.
4. VERIFY THE LOCATION AND DEPTH OF UNDERGROUND ELECTRIC LINES, FIBER LINES, AND OTHER COMMUNICATION LINES PRIOR TO IRRIGATION INSTALLATION.
5. LAY OUT WORK IN GENERAL CONFORMANCE WITH THE DRAWINGS. ADJUST NOZZLES, SPRINKLER ARCS, OR HEAD AND PIPE LOCATIONS TO COMPLEMENT ACTUAL FIELD CONDITIONS MAINTAIN HEAD-TO-HEAD COVERAGE. BALANCE THE PRECIPITATION RATE AMONG ALL SPRINKLERS WITHIN THE ZONE. ADD SUPPLEMENTAL SPRINKLERS AS NECESSARY TO PROVIDE HEAD-TO-HEAD COVERAGE.
6. PROVIDE ALL MISCELLANEOUS MATERIALS NECESSARY TO MAKE THE SYSTEM FULLY FUNCTIONAL.
7. IRRIGATION SYSTEM IS DESIGNED FOR 60(+/-) PSI AT THE BASE OF ALL SPRINKLER HEADS. WATER PRESSURE AT THE WATER SUPPLY HAS BEEN ASSUMED TO BE +/-70 PSI. NOTIFY LANDSCAPE ARCHITECT IF WATER SUPPLY PRESSURE DIFFERS.
8. WATER SUPPLY IS LOCATED AT THE PROPOSED 3" CAPPED FLANGE ON THE NORTHWEST CORNER OF 1ST AND MAIN STREET.
9. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR PRODUCT SPECIFIC INSTALLATION.
10. MAIN LINE PIPING SHALL BE PVC CLASS 200 SDR 21. ALL MAIN LINE PIPING SHALL HAVE TRACER WIRE.
11. LATERAL PIPING SHALL BE PVC CLASS 160 SDR 26.
12. IRRIGATION SLEEVING SHALL BE SCHEDULE 40 PVC. ALL SLEEVING SHALL HAVE TRACER WIRE.
13. LATERAL PIPING WITH NO SIZE LABEL INDICATED ON THE DRAWINGS SHALL BE 1", PVC CLASS 160 SDR 26.
14. INSTALL LATERAL PIPING A MINIMUM 12 INCHES DEEP AND INSTALL MAIN LINE PIPING A MINIMUM 18 INCHES DEEP. NOTIFY LANDSCAPE ARCHITECT A MINIMUM 48 HOURS IN ADVANCE OF PIPING INSTALLATION.
15. USE TEFLON TAPE ON ALL THREADED JOINTS.
16. SET SPRINKLER HEADS, QUICK COUPLER VALVES, AND OTHER VALVES WITH STEMS PERPENDICULAR TO FINISHED GRADE.
17. PLACE ALL VALVES IN SERVICE BOXES.
18. ADJUST SPRINKLER HEADS FOR GRADE, AS NECESSARY, AFTER TURFGRASS HAS BEEN ESTABLISHED AND ALL SETTLEMENT AT SPRINKLER HEADS HAS OCCURRED. SET TOP OF SPRINKLER HEAD $\frac{3}{4}$ " BELOW FINISH GRADE OR $\frac{3}{8}$ " BELOW THE TURFGRASS ROOT ZONE. SET TOP OF SPRINKLER HEAD 1" BELOW CONCRETE SURFACES WHEN ADJACENT TO CONCRETE WALKS OR CONCRETE CURBS.
19. CONDUCT PERFORMANCE TEST IN THE PRESENCE OF OWNER AND LANDSCAPE ARCHITECT FOLLOWING COMPLETION OF SYSTEM INSTALLATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
20. CONDUCT AND DEMONSTRATE TO THE OWNER THE WINTERIZATION AND SPRING START-UP PROCESS IN THE FALL FOLLOWING IRRIGATION SYSTEM COMPLETION.



1. ALL ASSEMBLY PARTS (THREADED NIPPLES, FITTINGS, ETC.) SHALL BE GALVANIZED OR BRASS PER LOCAL CODES AND REQUIREMENTS.
2. ALL GALVANIZED CONNECTIONS SHALL TO BE MADE USING PIPE THREAD SEALANT.

NOT TO SCALE



1. ALL ASSEMBLY PARTS (THREADED NIPPLES, FITTINGS, ETC.) SHALL BE GALVANIZED OR BRASS PER LOCAL CODES AND REQUIREMENTS.
2. GALVANIZED NIPPLE SHALL EXTEND 12" PAST THE EDGE OF THE CONCRETE FOOTING.
3. SCH. 80 PVC MALE ADAPTER SHALL BE USED IN CONNECTION FROM COPPER TO THE MAINLINE.
4. BACKFLOW PREVENTION DEVICE SHALL BE LOCATED IN PLANTING AREA UNLESS APPROVED BY OWNER'S REPRESENTATIVE.
5. ALL THREADED CONNECTIONS SHALL BE MADE USING PIPE THREAD SEALANT. ALL SCH. 80 PVC TO COPPER CONNECTIONS TO BE MADE USING TEFLON TAPE.

$$\frac{2}{1.10}$$

Diagram illustrating the cross-section of a trench for a direct burial decoder control wire installation. The diagram shows the trench depth (12" IN PLANTING AREA), the width of the trench (24" MIN.), and the location of the control wire (PRESSURIZED LINE (MAIN LINE)) and the detectable locator tape (DETECTABLE LOCATOR TAPE). The diagram also shows the finished grade and the pavement surface.

1. SEE IRRIGATION LEGEND FOR MAINLINE AND LATERAL LINE PIPE SIZES AND TYPE.
2. DIRECT BURIAL DECODER CONTROL WIRES SHALL BE INSTALLED IN SCHEDULE 40 PVC ELECTRICAL CONDUIT IF REQUIRED.
3. 2-WIRE DECODER CONTROL WIRE SHALL BE INSTALLED IN SCHEDULE 40 PVC ELECTRICAL CONDUIT.
4. DETECTABLE LOCATOR TAPE SHALL BE LOCATED SIX INCHES (6") ABOVE THE ENTIRE MAINLINE RUN

$$\frac{3}{1.10}$$

Diagram illustrating the cross-section of a trench installation, showing the following components and dimensions:

- PAVEMENT BASE ROCK**: The top layer of the installation.
- CLEAN BACKFILL, 95% RELATIVE COMPACTION UNDER PAVING, BACKFILL IS INCIDENTAL TO IRRIGATION SYSTEM BID ITEM.**: The layer immediately below the pavement base rock.
- 30"**: Dimension indicating the depth of the backfill layer.
- DECODER CONTROL WIRES, SLEEVE UNDER PAVING, INSTALL ADJACENT TO PRESSURIZED MAINLINE. BUNDLE SHALL BE NO MORE THAN 50% OF PIPE DIAMETER.**: Wires located adjacent to the mainline.
- MAINLINE, SLEEVE UNDER PAVING TO BE TWO TIMES THE DIAMETER OF THE PRESSURIZED MAINLINE PIPE.**: The mainline pipe.
- NON-PRESSURIZED LATERAL LINE. SLEEVE UNDER PAVING TO BE TWO TIMES THE DIAMETER OF THE LATERAL LINE.**: The lateral line pipe.

1. SEE IRRIGATION LEGEND FOR MAINLINE AND LATERAL LINE PIPE SIZES AND TYPE.
2. ALL SLEEVES SHALL BE SCHEDULE 40 PVC PIPE.
3. ALL SLEEVES SHALL EXTEND 12" BEYOND THE EDGE OF PAVEMENT.
4. END OF SLEEVES SHALL BE LOCATED WITH A WOODEN STAKE OR PVC PIPE. LOCATORS SHALL RUN CONTINUOUSLY FROM THE EDGE OF THE SLEEVE TO FINISHED GRADE.

$$\frac{4}{1.10}$$

1.10

Diagram illustrating the 120 VAC power distribution system for the rain sensor. The system includes a main power line, a junction box, and multiple branch lines connecting to rain sensor units. Labels indicate the power source, the rain sensor, the controller (shown as a reference), and the specific wire paths (Wire Path #1, Wire Path #2, Master Valve). A note specifies that all wire splicing must be made with approved connections.

NOTES:
A. ALL WIRE SPlicing SHALL BE MADE WITH APPROVED CONNECTIONS.

A. ALL WIRE SPlicing SHALL BE MADE WITH APPROVED CONNECTIONS.

B. MAKE ALL WIRE SPICES IN VALVE BOXES.

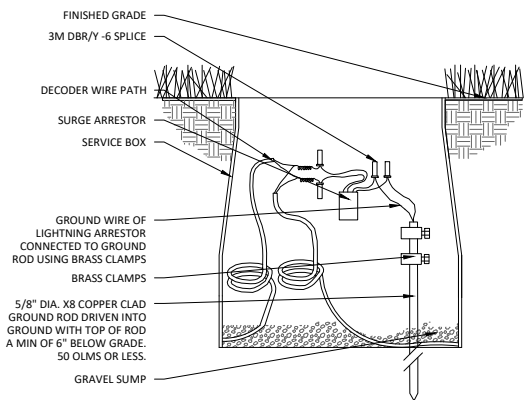
C. LEAVE A MINIMUM OF 24" EXTRA WIRE AT ALL SPLICE POINTS.

D. MAXIMUM DISTANCE FROM DECODER TO VALVE = 150 FT.

E. MAXIMUM WIRE LENGTH = 10,200 FT.

F. WIRE LENGTHS INCLUDE MASTER VALVE AND ~~24"~~ WIRE

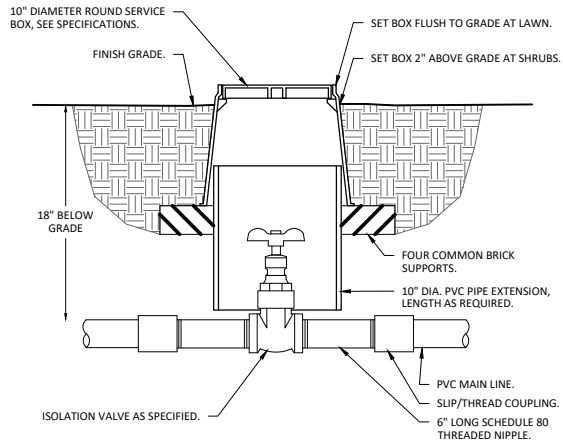
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- THE LIGHTNING ARRESTOR SHOULD BE INSTALLED IN EACH OF THE FOLLOWING SCENARIOS:
1. NEAR THE 2-WIRE IRRIGATION CONTROLLER: THE LIGHTNING ARRESTOR SHOULD BE SPICED INTO EACH 2-WIRE PATH IMMEDIATELY AFTER THE CONTROLLER IN THE CLOSEST LOCATION THAT THE LIGHTNING ARRESTOR CAN PROPERLY BE GROUNDED; THIS PROVIDES SURGE PROTECTION FOR THE 2-WIRE IRRIGATION CONTROLLER.
 2. ALONG 2-WIRE PATH: THE LIGHTNING ARRESTOR SHOULD BE SPECIFIED INTO THE 2-WIRE PATH EVERY 500 FT OR EVERY 5 DECODERS, WHICHEVER IS SMALLER, AND AT THE END OF ANY 2-WIRE PATH BRANCH LONGER THAN 25 FT.
 3. AT THE END OF THE 2-WIRE PATH: THE LIGHTNING ARRESTOR SHOULD BE INSTALLED AT THE END OF EACH 2-WIRE PATH BRANCH 25 FT OR LONGER WHEN USING A STAR CONFIGURATION.

1 LIGHTNING ARRESTOR

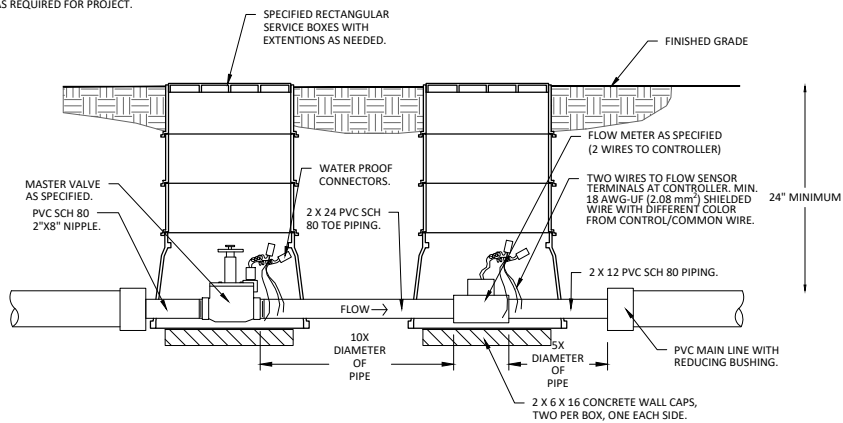
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2 ISOLATION VALVE

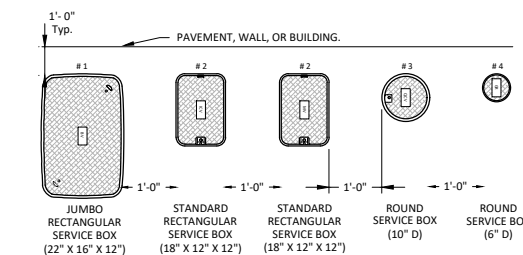
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NOTE: INLET PIPE ENTERING METER: LENGTH MUST BE A MIN. OF 10 X PIPE DIA.
OUTLET PIPE LEAVING METER: LENGTH MUST BE MIN. OF 5 X PIPE DIA.
INLET AND OUTLET PIPE MUST BE STRAIGHT PIPE WITH NO FITTINGS OR TURNS UNTIL AFTER THESE SPECIFIED LENGTHS. PIPE AND FITTINGS MAY BE SCH 80 PVC SOLVENT WELD, THREADED SCH 80 PVC OR BRASS, AS REQUIRED FOR PROJECT.



3 MASTER VALVE & FLOW SENSOR

NOT TO SCALE



EXAMPLE

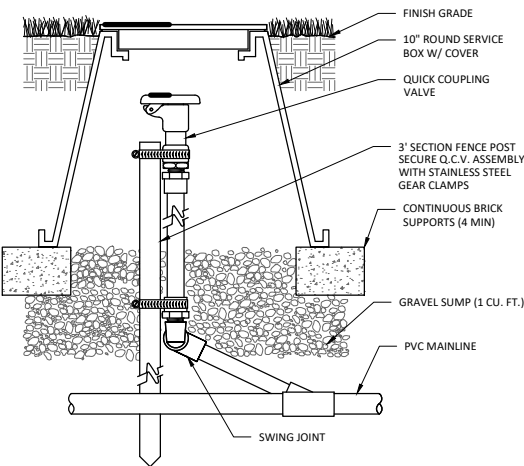
POTABLE WATER SYSTEM ON CONTROLLER 'A', REMOTE CONTROL VALVE STATION #3.

- NOTES:
1. SERVICE BOXES SHALL BE LABELED BY HOT IRON BRANDING OR ALUMINUM ASPHALTIC BASE WATER PROOF PAINT.
 2. LOCATE SERVICE BOXES ASSEMBLIES IN PLANTING AREA WHEN POSSIBLE.
 3. VALVE LOCATIONS SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
 4. SERVICE BOXES SHALL BE CENTERED ABOVE VALVE ASSEMBLIES TO FACILITATE ACCESS AND MAINTENANCE.
 5. SERVICE BOXES SHALL BE FLUSH WITH FINISHED GRADE.
 6. SERVICE BOXES SHALL BE SET PARALLEL TO EACH OTHER AND PERPENDICULAR TO THE EDGE OF PAVEMENT.
 7. SEE OTHER IRRIGATION DETAILS FOR FURTHER INFORMATION.

Water type	Controller	Designation	Box size	Lid Color	Identification Guide
PW	A	MV	# 2	Green	Master valve
PW	A	FS	# 2	Green	Flow sensor
PW	A	IV	# 2	Green	Isolation Valve
PW	A	ARV	# 4	Green	Air release valve
PW	A	DFV	# 3	Green	Drip Flush Valve
PW	A	QCV	# 3	Green	Quick coupler valve
PW	A	RCV	# 2	Green	Remote control valve
PW	A	MS	# 2	Green	Moisture sensor
PW	A	GR	# 4	Green	Grounding rod
PW	A	SB	# 3	Green	Splice box
PW	A	FC	# 3	Green	Future connection

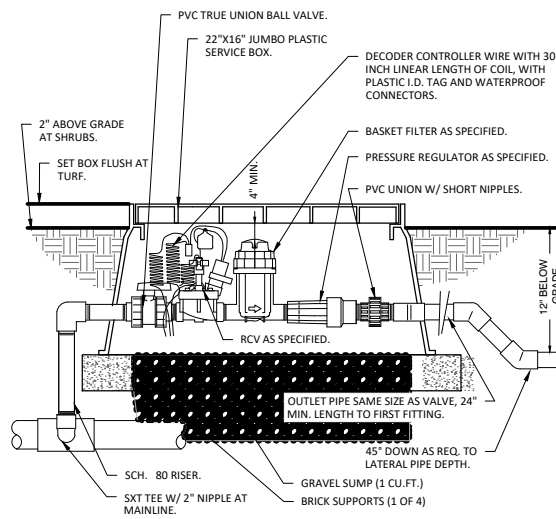
4 SERVICE BOX REQUIREMENTS

NOT TO SCALE



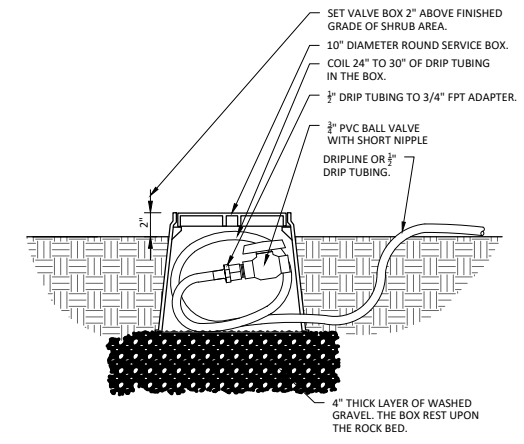
5 QUICK COUPLER VALVE

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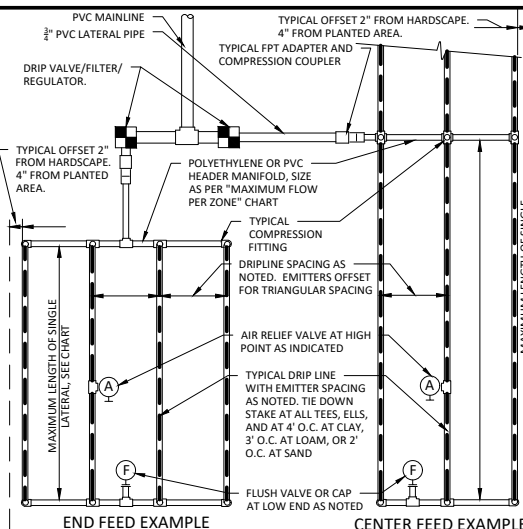
6 1" DRIP VALVE KIT

NOT TO SCALE



7 DRIP FLUSH VALVE IN BOX

NOT TO SCALE

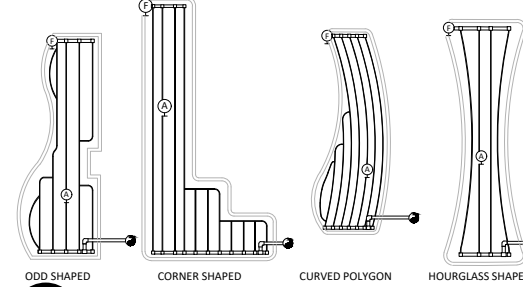
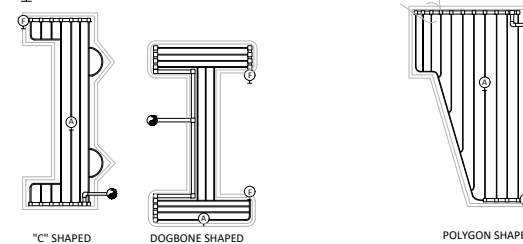
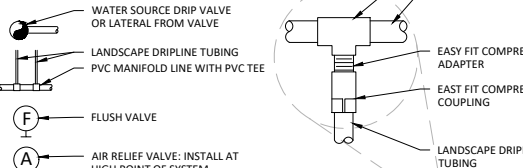


- SLOPED CONDITION NOTE:
1. DRIPLINE LATERALS SHOULD FOLLOW THE CONTOURS OF THE SLOPE WHENEVER POSSIBLE.
 2. INSTALL AIR RELIEF VALVE AT THE HIGHEST POINT.
 3. NORMAL SPACING WITHIN THE TOP 2/3 OF SLOPE.
 4. INSTALL DRIPLINE AT 25% GREATER SPACING AT THE BOTTOM 1/3 OF THE SLOPE.
 5. WHEN ELEVATION CHANGE IS 10 FT OR MORE, ZONE THE BOTTOM ON A SEPARATE VALVE.

GRID PRECIPITATION RATES (IN/HR)			
EMITTER SPACING	LATERAL SPACING	0.6	0.9
12	12	0.96	1.44
18	18	0.69	1.03
24	24	0.28	0.41

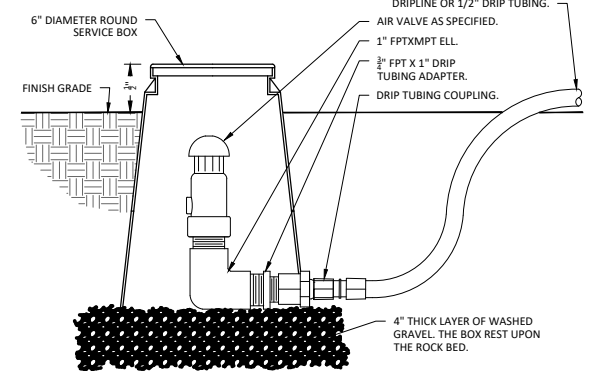
LATERAL FLOW PER 100 FT (GPM)			
EMITTER FLOW	12" SPACING	18" SPACING	24" SPACING
0.6 GPH	1.0 GPM	0.67 GPM	0.50 GPM
0.9 GPH	1.5 GPM	1.0 GPM	0.75 GPM

MAXIMUM LATERAL LENGTH (FEET)			
EMITTER FLOW RATE GPH			
PSI	12" SPACING	18" SPACING	24" SPACING
10	125 96	175 135	218 171
20	249 191	350 171	442 340
30	307 236	434 333	550 422
40	350 268	495 380	627 171
50	125 96	175 135	218 171
60	125 96	175 135	218 171



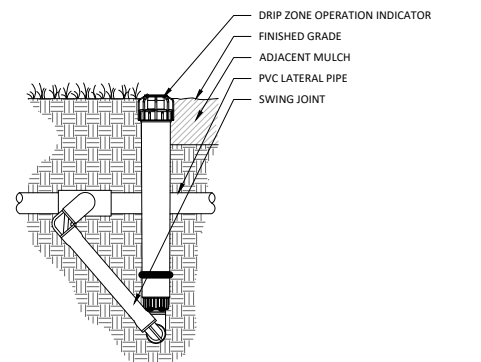
8 TYPICAL DRIPLINE REQUIREMENTS

NOT TO SCALE



9 DRIP AIR RELIEF VALVE IN BOX

NOT TO SCALE



10 DRIP ZONE OPERATION INDICATOR

NOT TO SCALE

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MARSHALLTOWN, IA 50101 129221 (04) 301129221.dwg 2/16/2025 10:19:38 AM

GENERAL NOTES:

1. UTILITIES: THE CONTRACTOR SHALL COORDINATE WORK WITH UTILITY COMPANIES WITH RESPECT TO PROTECTING, RELOCATING, AND CONSTRUCTING UTILITY FACILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOLLOWING THE GUIDELINES OF EACH UTILITY IN PROTECTING THEIR FACILITIES AND SHALL EXERCISE ALL DUE CAUTION AND USE CONSTRUCTION METHODS AND EQUIPMENT TO COMPLETE WORK WITHOUT DAMAGING UTILITIES. ALL COSTS FOR STAGING CONSTRUCTION FOR UTILITY INSTALLATION, PROVIDING TEMPORARY SUPPORTS FOR UTILITIES WITH ASSISTANCE FROM THE AFFECTED UTILITY COMPANY, AND COORDINATING WITH UTILITIES, INCLUDING DELAYS, SHALL BE INCIDENTAL TO THE CONTRACT. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED. THE EXACT LOCATION AND ELEVATION OF ALL UTILITIES SHALL BE DETERMINED BY THE CONTRACTOR AT THE TIME OF CONSTRUCTION. IT SHALL BE THE DUTY OF THE CONTRACTOR TO ASCERTAIN WHETHER ANY ADDITIONAL FACILITIES, OTHER THAN THOSE SHOWN ON THE PLANS, MAY BE PRESENT.
2. CONSTRUCTION LIMITS: THE CONTRACTOR SHALL NOT DISTURB DESIRABLE GRASS AREAS AND DESIRABLE TREES OUTSIDE THE CONSTRUCTION LIMITS. THE CONTRACTOR SHALL NOT PARK, SERVICE VEHICLES AND EQUIPMENT, OR USE THESE AREAS FOR STORAGE OF MATERIALS. STORAGE, PARKING AND SERVICE AREA(S) WILL BE SUBJECT TO THE APPROVAL OF THE ENGINEER OR AS DESIGNATED IN THE PLANS. CONTRACTORS SHALL NOT PARK IN PUBLIC PARKING LOTS OR ON CITY STREETS ADJACENT TO THE PROJECT.
3. THE CONTRACTOR SHALL ACCESS THE SITE IN A MANNER THAT DOES NOT DAMAGE EXISTING PAVED SURFACES, SIDEWALKS, AND TRAILS THAT ARE NOT DESIGNATED TO BE REPLACED. ANY DAMAGE TO THESE SURFACES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE AS APPROVED BY THE ENGINEER. ALL WORK SHALL BE CONFINED TO THE PROJECT RIGHT OF WAY LIMITS AND TEMPORARY CONSTRUCTION EASEMENTS. THIS INCLUDES, BUT NOT LIMITED TO, EXCAVATION, PIPE INSTALLATION, PAVING OPERATIONS, AND REMOVALS. ANY DAMAGE CAUSED TO ADJACENT PROPERTY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR REPAIR AND REPLACEMENT.
4. ACCESS TO PROPERTIES: THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN ACCESS TO INDIVIDUAL PROPERTIES DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE WITH AREA RESIDENTS AND/OR PROPERTY OWNERS PRIOR TO CHANGING ACCESS TO PROPERTIES.
5. WORK SEQUENCE: THE CONTRACTOR SHALL SCHEDULE THEIR WORK AND THE WORK OF THEIR SUBCONTRACTORS IN SUCH A MANNER THAT WILL ENSURE A MINIMAL AMOUNT OF INCONVENIENCE TO THE ABUTTING PROPERTY OWNERS. FINAL GRADING SHALL FOLLOW COMPLETION OF THE PAVING AS SOON AS POSSIBLE. IF THE ENGINEER DETERMINES THE PROGRESS OF THE WORK IS UNSATISFACTORY, PARTIAL PAYMENTS WILL BE WITHHELD IN FULL OR PART UNTIL SATISFACTORY PROGRESS IS MADE. CLEANING OF THE SITE IS REQUIRED WHEN WORK IS EITHER SUSPENDED OR COMPLETED. PRIOR TO STARTING WORK, THE CONTRACTOR SHALL SUBMIT A STAGING SCHEDULE FOR THE ENGINEER'S APPROVAL. THE STAGING SCHEDULE SHALL BE UPDATED PERIODICALLY TO REFLECT ANY CHANGES.
6. TRAFFIC SIGNS: THE CONTRACTOR SHALL NOT REMOVE ANY CITY OF MARSHALLTOWN TRAFFIC CONTROL SIGNS OUTSIDE OF THE PROJECT LIMITS. THE CONTRACTOR SHALL NOTIFY MARSHALLTOWN PUBLIC WORKS, A MINIMUM OF TWO BUSINESS DAYS IN ADVANCE FOR SIGN REMOVAL, RELOCATION, AND RESET. WORK SHALL BE COMPLETED BY CITY PERSONNEL ONLY.
7. PAVEMENT REMOVAL: EXISTING PAVEMENT TO BE REMOVED SHALL BE SAW CUT AT REMOVAL LIMITS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER. UNNECESSARY SURFACE BREAKS OR PREMATURE SPALLING THAT OCCURS DURING THE REMOVAL PROCESS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE METHOD OF REPAIR WILL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. ALL HOT MIX ASPHALT AND CONCRETE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR DISPOSAL UNLESS OTHERWISE SPECIFIED IN THE PLANS.
8. ABANDONED UTILITY LINES: ALL REMOVAL AND DISPOSAL OF ABANDONED UTILITY LINES INCLUDING GAS MAINS, TELEPHONE CONDUITS, SERVICE LINES, ETC., REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL TO THE CONTRACT.
9. BACKFILLING HOLES: ALL HOLES RESULTING FROM OPERATIONS OF THE CONTRACTOR, INCLUDING REMOVAL OF FENCE POSTS AND UTILITY POLES, SHALL BE FILLED AND CONSOLIDATED TO FINISHED GRADE, AS APPROVED BY THE ENGINEER, TO PREVENT FUTURE SETTLEMENT AND SHALL BE FILLED IMMEDIATELY. ANY PORTION OF THE RIGHT-OF-WAY OR PROJECT LIMITS DISTURBED BY ANY SUCH OPERATIONS SHALL BE RESTORED TO AN ACCEPTABLE CONDITION. THIS OPERATION SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
10. STORM/SANITARY SEWERS: THE CONTRACTOR SHALL MAINTAIN FLOW AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FLOW DIVERTING AND/OR BYPASS PUMPING REQUIRED TO FACILITATE CONSTRUCTION. THE CONTRACTOR SHALL PROTECT ALL STORM SEWER INLETS AND CULVERTS FROM SILTATION AND DEBRIS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE STEEL PLATES OVER INTAKES AND MANHOLES PRIOR TO PLACEMENT OF PAVEMENT TO PREVENT SOIL FROM ENTERING INTO THE SEWER. THE COSTS FOR PLACING STEEL PLATES FOR PAVING OPERATIONS SHALL BE INCIDENTAL TO THE CONTRACT ITEMS.
11. EXISTING STORM SEWER REMOVAL: EXISTING STORM SEWER THAT IS DESIGNATED TO BE REMOVED OR ABANDONED SHALL BE REMOVED ONLY WHEN THE CONSTRUCTION HAS PROGRESSED TO THAT LOCATION AND/OR OTHER PROPOSED WORK REQUIRED DUE TO THE REMOVAL OR ABANDONMENT HAVING BEEN COMPLETED. DRAINAGE SHALL BE MAINTAINED AT ALL TIMES. CONTRACTOR SHALL BE RESPONSIBLE FOR FLOW DIVERTING, TEMPORARY PIPE INSTALLATION AND/OR BYPASS PUMPING REQUIRED TO FACILITATE CONSTRUCTION, WHICH SHALL BE INCIDENTAL TO THE CONTRACT.
12. DEWATERING: DEWATERING REQUIRED FOR THE CONSTRUCTION OF ALL STRUCTURES, PIPES, REMOVALS, AND ANY OF ASSOCIATED CONSTRUCTION INCLUDED IN THIS PROJECT SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND AT THE CONTRACTOR'S COST. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE NECESSARY DEWATERING TO MAINTAIN WATER LEVELS 2 FEET OR MORE BELOW THE BOTTOM OF THE EXCAVATION TO MAINTAIN PROPER SUBGRADE SUPPORT FOR THE CONSTRUCTION. ALL COSTS ASSOCIATED WITH PLANNING, IMPLEMENTING, AND MAINTAINING DEWATERING REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT SHALL BE CONSIDERED INCIDENTAL TO MOBILIZATION. THIS INCLUDES ALL COSTS OF LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR DEWATERING.
13. FINAL INSPECTION: THE CONTRACTOR SHALL HAVE A REPRESENTATIVE AT THE FINAL INSPECTION AND WILL BE RESPONSIBLE TO OPEN ALL MANHOLES AND INTAKES FOR INSPECTION BY ENGINEER. WORKING DAYS WILL BE SUSPENDED AFTER SUBSTANTIAL COMPLETION OF WORK. A PUNCH LIST WILL BE ASSEMBLED AND THE CONTRACTOR WILL BE GIVEN A SCHEDULE IN WHICH TO COMPLETE THE PUNCH LIST ITEMS
14. ADA REQUIREMENTS: ALL WORK SHALL BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA). ANY WORK THAT DOES NOT MEET THESE REQUIREMENTS WILL BE CONSIDERED DEFECTIVE AND BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL PROVIDE SURVEY STAKING FOR THE GENERAL LAYOUT. PRIOR TO PLACEMENT OF THE SURFACE MATERIAL, THE CONTRACTOR WILL BE RESPONSIBLE TO VERIFY THAT THE SLOPES OF ALL SURFACES ARE WITHIN THE ALLOWABLE RANGES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF SLOPES CANNOT BE CONSTRUCTED WITHIN THE ALLOWABLE RANGE. FOLLOWING PLACEMENT OF THE SURFACE MATERIAL, THE CONTRACTOR SHALL MEASURE THE ACTUAL SURFACE SLOPE AND INITIAL AT THE APPROPRIATE LOCATION ON SIDEWALK COMPLIANCE SHEETS TO VERIFY THAT THE SLOPE IS WITHIN ALLOWABLE RANGES.THE CITY RESERVES THE RIGHT TO MEASURE THE SLOPES OF ANY SURFACE AFTER CONSTRUCTION. THERE IS NO TOLERANCE FOR SURFACES TO EXCEED THE MAXIMUM ALLOWABLE SLOPE. SURFACES THAT EXCEED THE MAXIMUM ALLOWABLE SLOPE WILL BE CONSIDERED DEFECTIVE AND SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
15. SITE CLEANUP: THE CONTRACTOR SHALL CLEAN ALL SURFACES PRIOR TO OPENING THE PROJECT TO THE PUBLIC. PICKUP BROOM

- OR STREET SWEEPER THAT CREATES A MINIMAL AMOUNT OF DUST SHALL BE USED FOR CLEANING. ALL COSTS FOR CLEANING SHALL BE INCIDENTAL TO THE CONTRACT.
16. STREET/LANE CLOSURE: THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF THREE BUSINESS DAYS IN ADVANCE FOR LANE CLOSURE AND SHALL RECEIVE APPROVAL BEFORE CLOSING ANY LANE TO TRAFFIC. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF THREE BUSINESS DAYS IN ADVANCE FOR STREET CLOSURE AND SHALL RECEIVE APPROVAL BEFORE CLOSING ANY STREET TO TRAFFIC.
17. ADJUSTMENT OF WATER VALVES: THE ADJUSTMENT OF WATER VALVES AND WATER SERVICE STOP BOXES TO FINAL GRADE (BOTH PUBLIC AND PRIVATE) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO PAVEMENT CONSTRUCTION. USE OF A THREADED COUPLING TO ADJUST THE CAP ELEVATION IS REQUIRED.
18. ROW AND EASEMENT LIMITS: STORAGE, PARKING, AND SERVICE AREA(S) WILL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL RESTORE ALL AREAS DISTURBED BY CONSTRUCTION.
19. RESTORATION: THE CONTRACTOR SHALL CONFINE THE OPERATIONS TO WITHIN THE GRADING LIMITS AS SHOWN ON THE PLANS UNLESS OTHERWISE AUTHORIZED BY THE PROJECT ENGINEER. ALL TREES, SHRUBS, GRASS, OR TURF BEYOND THE GRADING LIMITS THAT IS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT NO CHARGE TO THE CONTRACTING AUTHORITY, TO THE CONDITION THAT EXISTED PRIOR TO CONSTRUCTION. ALL GRASS SURFACES DISTURBED BY CONSTRUCTION SHALL BE SEEDED OR SODDED AS DIRECTED BY THE PLANS. THIS INCLUDES TURF AREAS DAMAGED BY EITHER CONSTRUCTION ACCESS AND/OR CONSTRUCTION ACTIVITIES. PAYMENT SHALL BE FOR THOSE DISTURBED AREAS WITHIN THE GRADING LIMITS.
20. WASTE SITES: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL, BROKEN PAVEMENT, ETC.) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. NO MATERIAL SHALL BE PLACED WITHIN THE CITY PROPERTY, UNLESS SPECIFICALLY STATED IN THE PLANS OR APPROVED BY THE ENGINEER.
21. DISPOSAL OF PAVEMENT: UNLESS OTHERWISE DIRECTED OR AUTHORIZED, ALL PAVEMENT MATERIALS WHICH ARE NOT SPECIFICALLY ADDRESSED OR DESCRIBED IN THE PLANS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR IN ACCORDANCE WITH CURRENT RULES AND REGULATIONS OF THE IOWA DEPARTMENT OF NATURAL RESOURCES MAY:

21.1. REMOVE THE MATERIAL FROM THE PROJECT AND STOCKPILE FOR THE CONTRACTOR'S FUTURE USE.

21.2. DISPOSE OF IN A LICENSED LANDFILL.
22. SAW-CUT TREE ROOTS: ALL TREE ROOTS EXCEEDING 1-1/2" IN DIAMETER WHICH ARE MANGLED BY EQUIPMENT DURING GRADING OR EXCAVATION SHALL BE CUT CLEANLY WITH A SAW. NO ROOTS WHICH EXCEED THE SPECIFIED DIAMETER SHALL BE LEFT STRIPPED OR MANGLED PRIOR TO BACKFILLING. CUTTING OF ROOTS IS CONSIDERED INCIDENTAL TO EXCAVATION.
23. REINFORCING STEEL: ALL REINFORCING STEEL DOWELS AND TIE BARS IN THE PAVING SHALL BE EPOXY-COATED UNLESS OTHERWISE NOTED.
24. CONTRACTOR PARKING: CONTRACTOR AND SUBCONTRACTOR PERSONNEL SHALL NOT PARK ON MAIN ST BETWEEN 2ND ST AND 3RD AVE, STATE ST BETWEEN 2ND ST AND 3RD AVE, CENTER ST BETWEEN STATE ST AND CHURCH ST, 1ST AVE BETWEEN STATE ST AND CHURCH ST OR 2ND AVE BETWEEN STATE ST AND CHURCH ST DURING ANY PHASE OF THE PROJECT. CONTRACTOR AND SUBCONTRACTOR PERSONNEL SHALL NOT PARK IN ANY PUBLIC PARKING LOTS BETWEEN 2ND AVE AND 3RD AVE AND STATE ST AND CHURCH ST. ALL PERSONNEL VEHICLES MUST BE PARKED OUTSIDE OF THESE AREAS TO ENSURE ADEQUATE PARKING IS PROVIDED FOR THE GENERAL PUBLIC AND LOCAL BUSINESSES.

STAGING NOTES:

1. THESE STAGING NOTES ARE NOT INTENDED TO CONFINE THE CONTRACTOR'S ACTIVITIES TO THE AREAS OF SUGGESTED STAGES ALONE. IT IS UNDERSTOOD THAT VARIOUS STEPS INCLUDED HEREIN MAY OCCUR SIMULTANEOUSLY. THE CONTRACTOR MAY CONDUCT SEVERAL OPERATIONS CONCURRENTLY, PROVIDED THAT TRAFFIC AND ACCESS IS MAINTAINED AND THESE OPERATIONS DO NOT CONFLICT WITH THE STAGING INDICATED HEREIN, OTHER PORTIONS OF THIS PROJECT AND OTHER CONSTRUCTION ACTIVITIES.
2. AS LONG AS WORK REMAINS ON THE PROJECT, THE CONTRACTOR SHALL REMAIN ON THE PROJECT. IF ISSUES EXIST WITHIN A STAGE OF THE PROJECT WHICH ARE BEYOND THE CONTRACTOR'S CONTROL, THE CITY HAS THE OPTION TO REVISE THE CONSTRUCTION STAGING AND DIRECT THE CONTRACTOR TO WORK ON OTHER "UNAFFECTED" STAGES OR AREAS OF THE PROJECT AS SHOWN WITHIN THE CONTRACT DOCUMENTS, AT NO ADDITIONAL COST TO THE OWNER. THE OWNER MAY, AT THE OWNER'S DISCRETION, PROVIDE ADDITIONAL DAYS TO THE CONTRACTOR BASED UPON RELOCATION EFFORTS AND SCHEDULING JUSTIFICATION.
3. ONCE WORK WITHIN A STAGE HAS COMMENCED, THE CONTRACTOR SHALL CONTINUE WORK WITHIN THAT STAGE UNTIL ALL WORK WITHIN THAT STAGE HAS BEEN COMPLETED. IF WORK WITHIN THAT STAGE IS NOT COMPLETED AND THE CONTRACTOR REMOVES THE "NORMAL" SIZE CREW (AND/OR EQUIPMENT) FROM THE PROJECT WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER, THEN THE CONTRACTOR WILL BE CHARGED FOR EACH DAY THE SITUATION REMAINS.
4. ANY ADJUSTMENT TO THE STAGING AND/OR TRAFFIC CONTROL SHALL BE COORDINATED WITH THE CITY OF MARSHALLTOWN AND ENGINEER OF RECORD A MINIMUM OF ONE WEEK IN ADVANCE.

SIDEWALKS/PEDESTRIAN:

1. THE CONTRACTOR SHALL PROVIDE A PEDESTRIAN AND BIKE DETOUR / CONTROL PLAN FOR ALL STAGES, AS NOTED.
2. REFER TO IOWA DOT STANDARD ROAD PLAN TC-601 FOR SIDEWALK CLOSURE INFORMATION AND STANDARDS. PEDESTRIAN PATH CLOSURE BARRICADES SHALL BE PLACED AT THE BEGINNING AND END OF SIDEWALK CONSTRUCTION AREAS WITHIN EACH STAGE.
3. EXISTING SIDEWALK TO REMAIN IN PLACE AS LONG AS POSSIBLE TO PROVIDE ACCESS.
4. SIDEWALK TRAFFIC CONTROL SHALL REMAIN IN PLACE UNTIL SIDEWALKS ARE REPLACED, CLEANED, AND ACCESSIBLE.
5. THE COST FOR SIDEWALK ACCOMMODATIONS IS INCIDENTAL TO TEMPORARY TRAFFIC CONTROL.

TRAFFIC CONTROL NOTES:

1. THE J SHEETS DESCRIBE TRAFFIC CONTROL NECESSARY FOR THE CONSTRUCTION OF MAIN STREET. LOCAL TRAFFIC TO ADJACENT PROPERTIES SHALL BE MAINTAINED. ALL TRAFFIC CONTROL SIGNS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
2. THE CONTRACTOR SHALL COORDINATE TRAFFIC CONTROL WITH OTHER PROJECTS IN THE AREA AS REQUIRED. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE CLOSURES SHOWN ON THE J SHEETS. FOR ADDITIONAL INFORMATION, REFER TO THE 2023 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

3. THE LUMP SUM BID ITEM FOR "TEMPORARY TRAFFIC CONTROL" SHALL INCLUDE ALL COSTS FOR TRAFFIC CONTROL MEASURES DURING CONSTRUCTION FOR THIS PROJECT. ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED, AND REMOVED BY THE CONTRACTOR.
4. TRAFFIC CONTROL DEVICES, PROCEDURES, LAYOUTS, SIGNING, AND PAVEMENT MARKINGS INSTALLED WITHIN THE LIMITS OF THIS PROJECT SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS AS ADOPTED BY THE IOWA DEPARTMENT OF TRANSPORTATION PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC) CHAPTER 130.
5. ALL TRAFFIC CONTROL SIGNS SHALL BE PLACED A MINIMUM OF TWO (2) FEET CLEAR OF THE BACK OF CURB OR OUTSIDE EDGE OF SHOULDER WHERE POSSIBLE.
6. ALL DETOUR SIGNS AND ROAD CLOSURE BARRICADES SHALL BE INSTALLED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO CLOSING THE ROAD.
7. ALL SIGNS SHALL BE POST MOUNTED UNLESS NOTED OR OTHERWISE APPROVED BY THE CITY.
8. PROPOSED SIGN SPACING MAY BE MODIFIED, AS APPROVED BY THE ENGINEER, TO MEET EXISTING FIELD RESTRICTIONS OR TO PREVENT OBSTRUCTION OF THE MOTORIST'S VIEW OF PERMANENT SIGNING.
9. PROPOSED CHANGES IN THE TRAFFIC CONTROL PLAN SHALL BE REVIEWED WITH THE CITY AND ENGINEER BEFORE CHANGES ARE MADE.
10. THIS LAYOUT DOES NOT INCLUDE ALL BARRICADES AS MAY BE REQUIRED BY THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
11. ALL "STOP" AND OTHER REGULATORY SIGNS SHALL NOT BE DISTURBED. PERMANENT SIGNING THAT CONVEYS A MESSAGE CONTRARY TO THE MESSAGE OF THE TEMPORARY SIGNING NOT APPLICABLE TO THE WORKING CONDITIONS SHALL BE COVERED BY THE CONTRACTOR AS APPROVED BY THE CITY. IF THE CONTRACTOR AND THE CITY DETERMINE A SIGN MUST BE REMOVED FOR ANY STAGE OF CONSTRUCTION IT SHALL BE REMOVED AND RELOCATED BY PERSONNEL FROM THE CITY OF MARSHALLTOWN. THE CONTRACTOR SHALL NOTIFY PUBLIC WORKS A MINIMUM OF TWO BUSINESS DAYS IN ADVANCE FOR SIGN REMOVAL, RELOCATION, AND RESET. WORK SHALL BE COMPLETED BY CITY PERSONNEL ONLY.
12. ANY TEMPORARY REGULATORY SIGNS ARE TO BE PROVIDED, LOCATED, AND MAINTAINED BY THE CONTRACTOR.
13. ALL CONTRACTOR FURNISHED TRAFFIC CONTROL AND FIXED, POST MOUNTED, TRAFFIC CONTROL SIGNS USED ON THIS PROJECT SHALL BE SHEETED WITH HIGH-VISIBILITY PRISMATIC REFLECTIVE SHEETING (TYPE III OR HIGHER).
14. TYPE "C" STEADY BURN WARNING LIGHTS ARE NOT REQUIRED FOR VERTICAL PANELS, BARRICADES, AND DRUMS WHEN THESE TRAFFIC CONTROL DEVICES ARE SHEETED WITH HIGH-VISIBILITY PRISMATIC REFLECTIVE SHEETING (TYPE III OR HIGHER).
15. ALL TRAFFIC LANE CLOSURES SHALL BE RE-OPENED FOR PUBLIC USE WITHIN 24 HOURS OF THE COMPLETION OF ACTIVE CONSTRUCTION WORK. THE CONTRACTOR SHALL PROPERLY CLEAN ALL SURFACES AND ELIMINATE ALL UNSAFE CONDITIONS PRIOR TO REMOVING TRAFFIC CONTROL DEVICES.
16. THE CONTRACTOR SHALL FURNISH THE CITY WITH NAMES AND TELEPHONE NUMBERS OF INDIVIDUALS RESPONSIBLE FOR THE MAINTENANCE OF TRAFFIC CONTROL DEVICES AND SIGNING. THE INDIVIDUAL(S) SHALL BE AVAILABLE FOR CORRECTIVE ACTION 24 HOURS A DAY, 7 DAYS A WEEK.
17. THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, MOVE, AND REMOVE ALL TRAFFIC CONTROL DEVICES ON THE PROJECT. ALL SIGNS SHALL BE REFLECTORIZED AND CONFORM AS TO DESIGN, COLOR, SIZE, AND LEGEND TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS."
18. PAVEMENT MARKINGS THAT CONFLICT WITH THE MEANING OF TEMPORARY PAVEMENT MARKINGS OR BARRICADES FOR THE STAGE UNDER CONSTRUCTION SHALL BE REMOVED BY THE CONTRACTOR. TEMPORARY PAVEMENT MARKINGS SHALL BE PLACED AS INDICATED ON THE STAGING PLANS.
19. THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS WITH BOTH WRITTEN NOTICE AND PERSONAL CONTACT FOR WHEN ACCESS TO A PROPERTY WILL EITHER BE RESTRICTED OR NOT BE AVAILABLE DUE TO CONSTRUCTION ACTIVITIES.
20. NO FIELD MEASUREMENT SHALL BE MADE FOR THE TRAFFIC CONTROL BID ITEM. THE CONTRACTOR SHALL BE PAID THE LUMP SUM BID AMOUNT FOR TRAFFIC CONTROL.
21. SOME CONSTRUCTION MAY REQUIRE TEMPORARY LANE CLOSURES NOT SHOWN ON THE PLANS. REFER TO PART 6 OF THE MUTCD FOR STANDARD LANE CLOSURE SIGNAGE.
22. SIGNAGE MAINTENANCE SHALL BE CONSIDERED INCIDENTAL TO TRAFFIC CONTROL AND REQUIRED AS NECESSARY OR DIRECTED BY THE ENGINEER.
23. THE LOCATION FOR STORAGE OF EQUIPMENT BY THE CONTRACTOR DURING NONWORKING HOURS SHALL BE AS APPROVED BY THE ENGINEER, AND THE CONTRACTOR SHALL PROVIDE A WRITTEN AGREEMENT WITH THE PROPERTY OWNER.
24. ALL TEMPORARY PAVEMENT REQUIRED TO PROVIDE ELEVATION TRANSITIONS BETWEEN PHASES AND OVER WINTER SHALL BE INCIDENTAL TO THE TRAFFIC CONTROL BID ITEM. NO ADDITIONAL PAYMENT SHALL BE MADE FOR TEMPORARY PAVEMENT. TEMPORARY PAVEMENT SHALL BE EITHER 4" HMA OR 5" PCC.
25. PHASE 2 TEMPORARY GRANULAR ACCESS TO STAGING/STORAGE OFF OF 1ST AVE SHALL BE INCIDENTAL TO TRAFFIC CONTROL AND NO ADDITIONAL PAYMENT SHALL BE MADE FOR INSTALLATION, MAINTENANCE, OR REMOVALS OF GRANULAR MATERIAL.



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CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

STAGING AND TRAFFIC CONTROL

SHEET

J.01



PCMS MESSAGE:

CENTER ST
CLOSED

CHURCH
TO
STATE ST

BEGINNING
DATE

LEGEND:

- PHASE 1
- PHASE 2
- PHASE 3

LEGEND

- TRAFFIC SIGN
- TYPE III BARRICADE
- PORTABLE DYNAMIC MESSAGE SIGN
- WORK AREA
- ROAD CLOSURE

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MARSHALLTOWN, IA 52501
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

SHEET
J.03

PCMS MESSAGE:

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CENTER ST
TO
1ST AVE

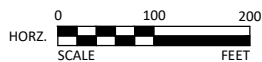
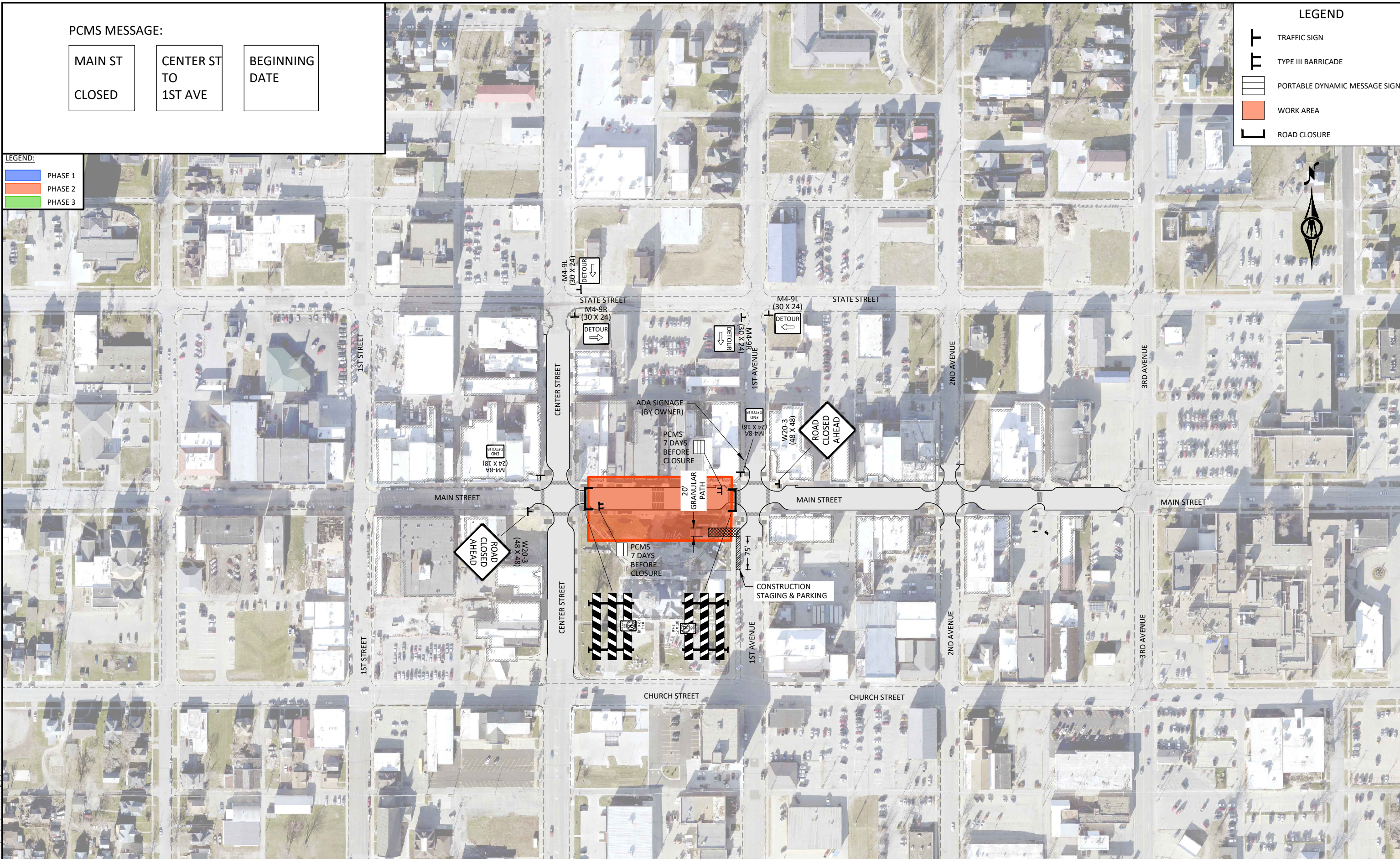
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LEGEND:

- PHASE 1
- PHASE 2
- PHASE 3

LEGEND

- TRAFFIC SIGN
- TYPE III BARRICADE
- PORTABLE DYNAMIC MESSAGE SIGN
- WORK AREA
- ROAD CLOSURE



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MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

SHEET

J.04

PCMS MESSAGE:

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TO
3RD AVE

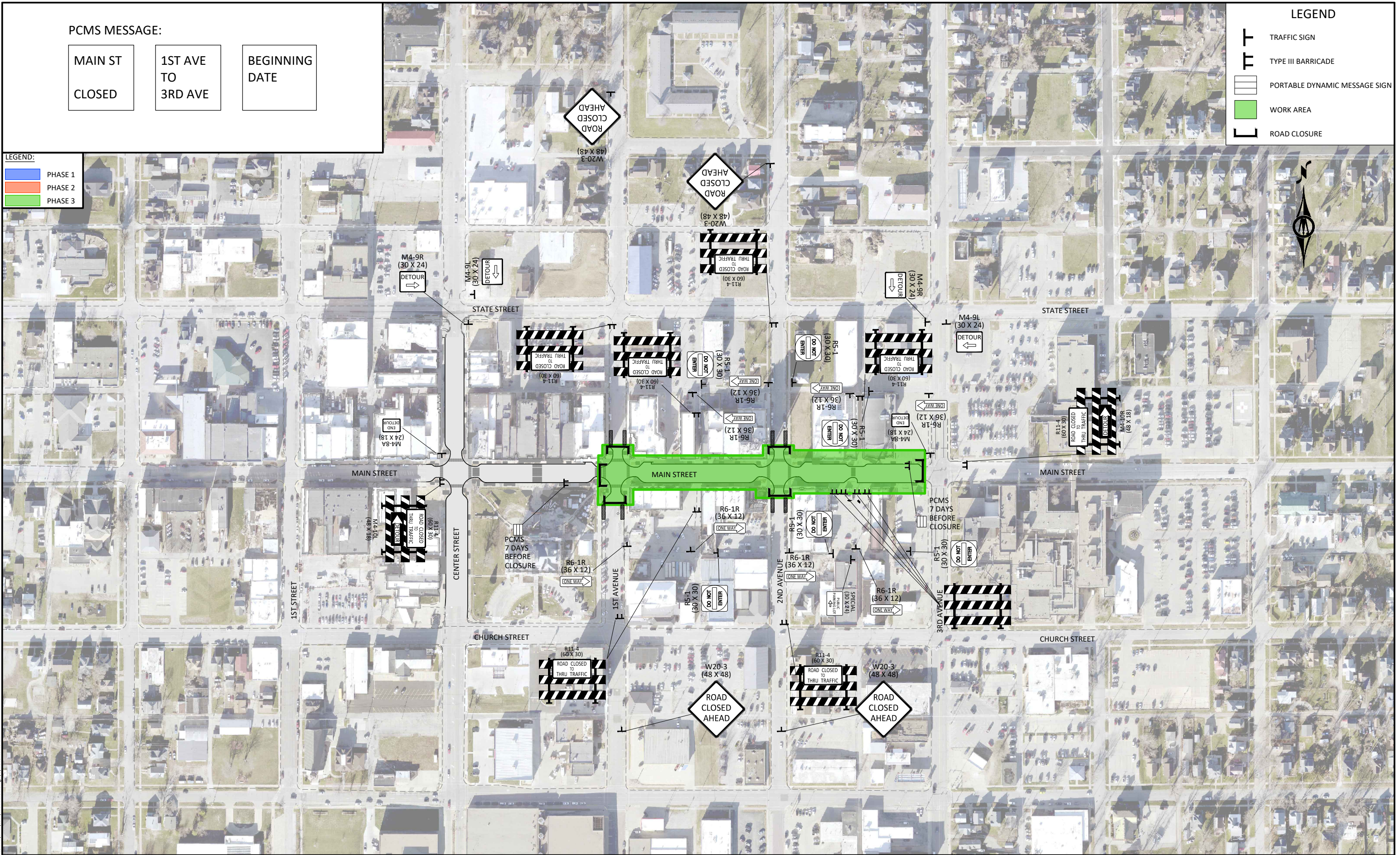
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DATE

LEGEND:

- PHASE 1
PHASE 2
PHASE 3

LEGEND

- TRAFFIC SIGN
TYPE III BARRICADE
PORTABLE DYNAMIC MESSAGE SIGN
WORK AREA
ROAD CLOSURE



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STAGING AND TRAFFIC CONTROL

SHEET
J.05

PCMS MESSAGE:

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CLOSED

1ST AVE
TO
3RD AVE

BEGINNING
DATE

LEGEND:

- PHASE 1
- PHASE 2
- PHASE 3

LEGEND

- TRAFFIC SIGN
- TYPE III BARRICADE
- PORTABLE DYNAMIC MESSAGE SIGN
- WORK AREA
- ROAD CLOSURE

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MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

SHEET
J.06

PHASE 1 NOTES:

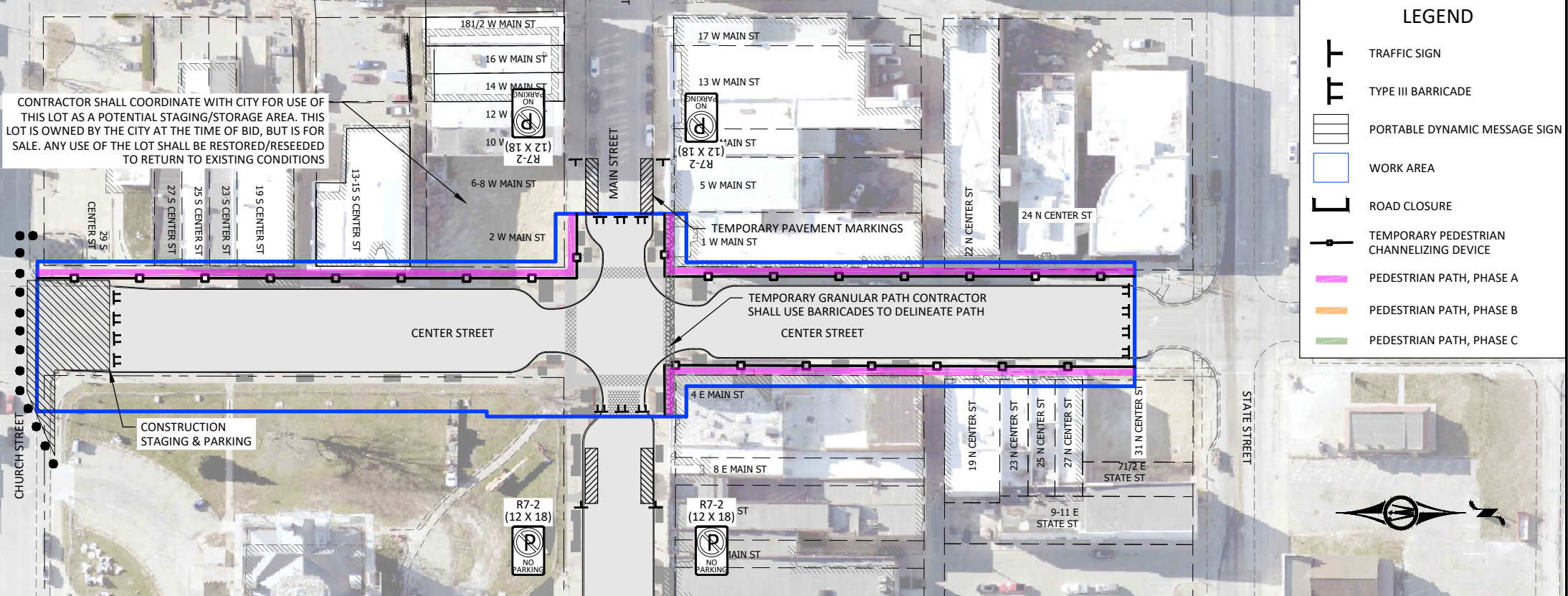
- INSTALL PDMS 7 DAYS IN ADVANCE OF CLOSURE (ONE NB AND ONE SB ON CENTER STREET)
- INSTALL TEMPORARY TRAFFIC CONTROL INCLUDING TEMPORARY PAVEMENT MARKINGS
- ALL WORK MUST BE COMPLETED, EXCEPT ITEMS WAITING FOR A PLANTING WINDOW, PRIOR TO COMMENCING NEXT PHASE.
- ROAD CLOSURES INCLUDE ENOUGH TYPE III BARRICADES TO CLOSE THE ROAD FROM CURB TO CURB.

PHASE 1A NOTES:

- 1) INSTALL TEMPORARY PEDESTRIAN TRAFFIC CONTROL INCLUDING TEMPORARY PEDESTRIAN CHANNELIZATION DEVICES
- 2) SAWCUT AND REMOVE EXISTING STREET PAVEMENT
- 3) INSTALL NEW WATER MAIN, STORM SEWER AND IRRIGATION. CONTRACTOR SHALL UTILIZE TWO UNDERGROUND UTILITY CREWS FOR INSTALLATION DURING PHASE 1 TO EXPEDITE THE INSTALLATION PROCESS. CALENDAR COMPLETION DATE IS BASED ON THE EXPECTATION OF HAVING TWO UTILITY CREWS ON SITE. LIQUIDATED DAMAGES WILL BE ENFORCED.
- 4) INSTALL UTILITY SERVICES TO EACH BUILDING.
 - a) CONTRACTOR SHALL COORDINATE WITH EACH PROPERTY TO PROVIDE A MINIMUM 48 HOUR NOTICE FOR CLOSURE OF FRONT DOOR IF UTILITY CONNECTION AFFECTS ACCESS.
 - b) EACH UTILITY CONNECTION SHALL CLOSE BUSINESS FOR A MAXIMUM OF 2 DAYS.
 - c) AFTER COMPLETION OF UTILITY CONNECTIONS CONTRACTOR SHALL REESTABLISH SIDEWALK WITH USE OF TEMPORARY GRANULAR MATERIAL. NO ADDITIONAL PAYMENT FOR TEMPORARY GRANULAR MATERIAL SHALL BE MADE.
- 6) GRADING, SUBBASE PREPARATION, GEOGRID INSTALLATION
- 7) PAVING PREPARATION AND STREET PAVING,
- 8) PARKING LANE PAVING

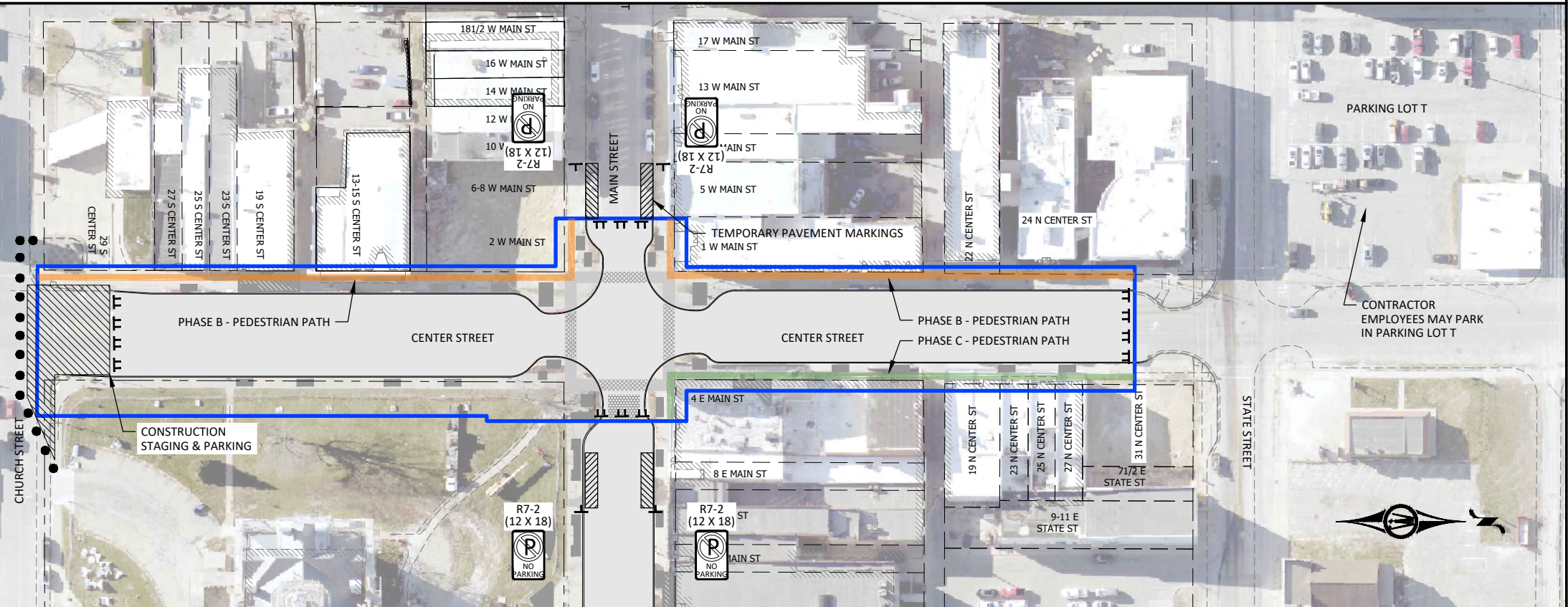
PHASE 1B/1C NOTES:

- 1) INSTALL TEMPORARY CONSTRUCTION FENCE ON ONE SIDE OF THE STREET AND ALLOW CONSTRUCTION ON SIDEWALKS ON OTHER SIDE OF THE STREET. FENCE SHALL BE INCIDENTAL TO TRAFFIC CONTROL AND NOT MEASURED FOR PAYMENT.
- 2) CONTRACTOR SHALL PROVIDE TEMPORARY PEDESTRIAN ACCESS FROM OPEN SIDEWALK ACROSS THE STREET TO ALL FRONT DOORS INSIDE THE CONSTRUCTION ZONE. CONTRACTOR SHALL PROVIDE ACCESS AT ALL TIME UNLESS UNFEASIBLE DUE TO WORK DIRECTLY IN FRONT OF THE BUSINESS FRONT DOOR.
- 3) CONSTRUCTION IS ESTIMATED TO BE COMPLETED AS FOLLOWS.
 - a) REMOVAL OF ALL SIDEWALK ALONG ENTIRE BLOCK. (MAXIMUM OF 1 DAY BUSINESS IMPACT FOR SIDEWALK REMOVAL)
 - i) CONTRACTOR SHALL COORDINATE WITH PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO IMPACT.
 - b) INSTALLATION OF GRANULAR PEDESTRIAN PATH. PATH SHALL EITHER DIRECT PEDESTRIAN LONGITUDINALLY ALONG BUILDING FRONTAGES TO EACH END OF THE BLOCK OR PERPENDICULARLY ACROSS THE STREET TO PROTECTED PEDESTRIAN ACCESS PATH ON OTHER SIDE OF THE STREET. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND CITY STAFF PRIOR TO SIDEWALK REMOVAL TO CONFIRM PEDESTRIAN ACCESS APPROACH.
- 4) INSTALL DRIVEWAYS, SIDEWALKS, AND PAVERS.
 - a) LIMIT PROPERTY IMPACTS/NON-ACCESS TO THE FOLLOWING TIME LIMITATIONS DURING SIDEWALK CONSTRUCTION.
 - i) MAXIMUM OF 1 DAY FOR PAVING PREPARATION FOR SIDEWALKS
 - ii) MAXIMUM OF 1 DAY FOR SIDEWALK POURING
 - iii) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE PAVING PREPARATION
 - iv) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE POURING
 - v) MAXIMUM OF 1 DAY FOR PAVER INSTALLATION.
- 5) PROPERTIES SHALL BE IMPACTED FOR A MAXIMUM OF 2 CONSECUTIVE DAYS UNLESS PREVIOUSLY DISCUSSED WITH THE PROPERTY OWNER AND APPROVAL IS OBTAINED BY THE CONTRACTOR IN WRITING.
- 6) ACCESS TO THE PROPERTY SHALL BE REESTABLISHED TO FRONT DOOR AFTER IMPACTED DAYS THROUGH USE OF TEMPORARY GRANULAR MATERIAL OR TEMPORARY ADA ACCESSIBLE WALKWAY CONSTRUCTED OF STURDY MATERIALS. ALL WALKWAY MATERIALS MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. TEMPORARY GRANULAR MATERIAL OR WALKWAY SHALL BE INCIDENTAL TO PEDESTRIAN TRAFFIC CONTROL. NO ADDITIONAL PAYMENT SHALL BE MADE.
- 7) UPON COMPLETION OF SIDEWALK ON ONE SIDE OF THE STREET THE CONTRACTOR CAN MOVE TO THE OTHER SIDE OF THE STREET. PAVER AND PLANTING AREAS DO NOT HAVE TO BE COMPLETED TO MOVE TO THE SIDE OF THE STREET. IF PAVER OR LANDSCAPING BEDS ARE NOT COMPLETED, THEY MUST BE FILLED WITH GRANULAR MATERIAL PRIOR TO MOVING TO OTHER SIDE OF THE STREET OR FENCED/BARRICADED OFF AS LONG AS A 5' WALKABLE PATH IS PROVIDED.
- 8) WHEN PAVERS AND LANDSCAPING AREAS ARE COMPLETED THE CONTRACTOR SHALL MINIMIZE IMPACT TO BUSINESSES AND LIMIT IMPACT TO A MAXIMUM OF 1 DAY PER BUSINESS WITH AT LEAST 48 HOURS' NOTICE. CONTRACTOR SHALL ALSO PROVIDE TEMPORARY CONSTRUCTION FENCING AROUND AREA TO PROTECT PEDESTRIANS.



A
1.07
NOT TO SCALE

SUB-PHASE A - PEDESTRIAN ACCESS - MAINLINE/PARKING CONSTRUCTION



B
1.07
NOT TO SCALE

SUB-PHASE B/C - PEDESTRIAN ACCESS - SIDEWALK CONSTRUCTION

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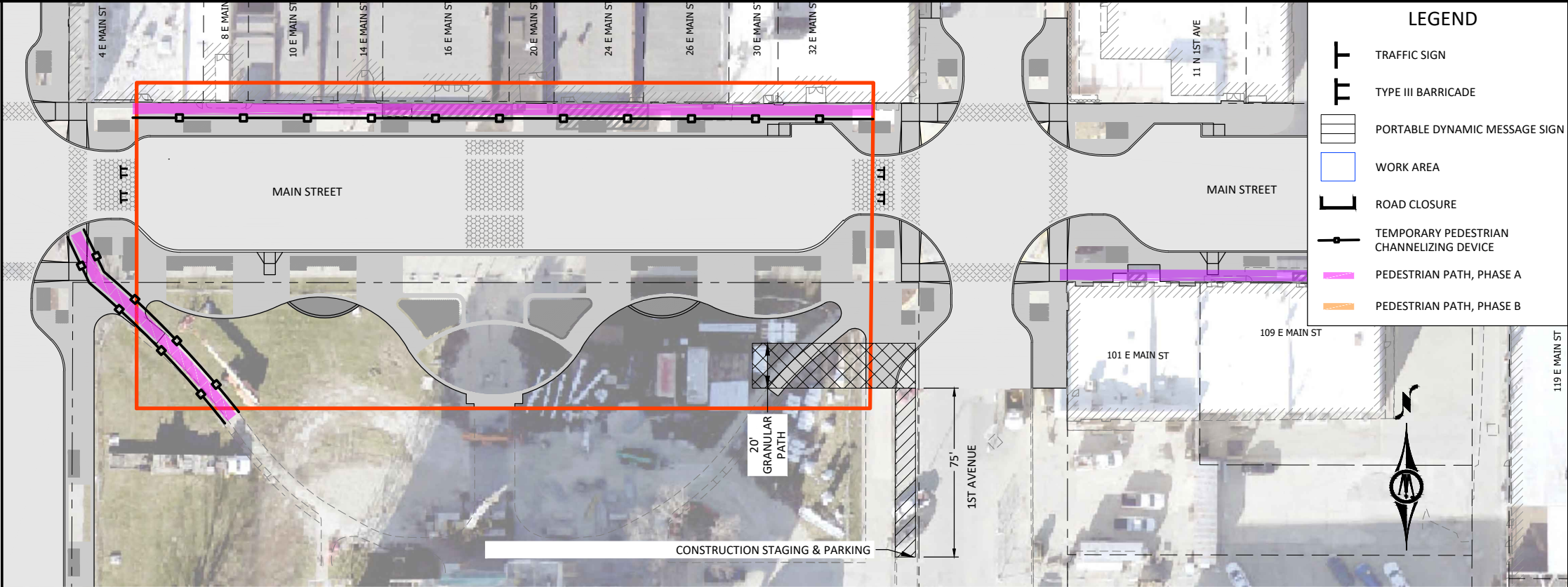
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

SHEET
J.07

- PHASE 2 NOTES:
- INSTALL PDMS 7 DAYS IN ADVANCE OF CLOSURE (ONE NB AND ONE SB ON CENTER STREET)
 - INSTALL TEMPORARY TRAFFIC CONTROL INCLUDING TEMPORARY PAVEMENT MARKINGS
 - ALL WORK MUST BE COMPLETED, EXCEPT ITEMS WAITING FOR A PLANTING WINDOW, PRIOR TO COMMENCING NEXT PHASE.
 - ROAD CLOSURES SHALL INCLUDE ENOUGH TYPE III BARRICADES TO CLOSE THE ROAD FROM CURB TO CURB.

- PHASE 2A NOTES:
- 1) INSTALL TEMPORARY PEDESTRIAN TRAFFIC CONTROL INCLUDING TEMPORARY PEDESTRIAN CHANNELIZATION DEVICES
 - 2) INSTALL PEDESTRIAN BUSINESS ACCESS SIGNAGE FOR IMPACTED BUSINESSES
 - 3) SAWCUT AND REMOVE EXISTING STREET PAVEMENT
 - 4) INSTALL NEW WATER MAIN, STORM SEWER AND IRRIGATION.
 - 5) INSTALL UTILITY SERVICES TO EACH BUILDING.
 - a) CONTRACTOR SHALL COORDINATE WITH EACH PROPERTY TO PROVIDE A MINIMUM 48 HOUR NOTICE FOR CLOSURE OF FRONT DOOR IF UTILITY CONNECTION AFFECTS ACCESS.
 - b) EACH UTILITY CONNECTION SHALL CLOSE BUSINESS FOR A MAXIMUM OF 2 DAYS.
 - c) DURING CLOSURE OF SIDEWALK FOR UTILITY SERVICE INSTALLATION THE CONTRACTOR SHALL ADJUST TEMPORARY PEDESTRIAN SIGNAGE TO PROVIDE UP-TO-DATE PEDESTRIAN NOTIFICATIONS AND ACCESS ROUTING.

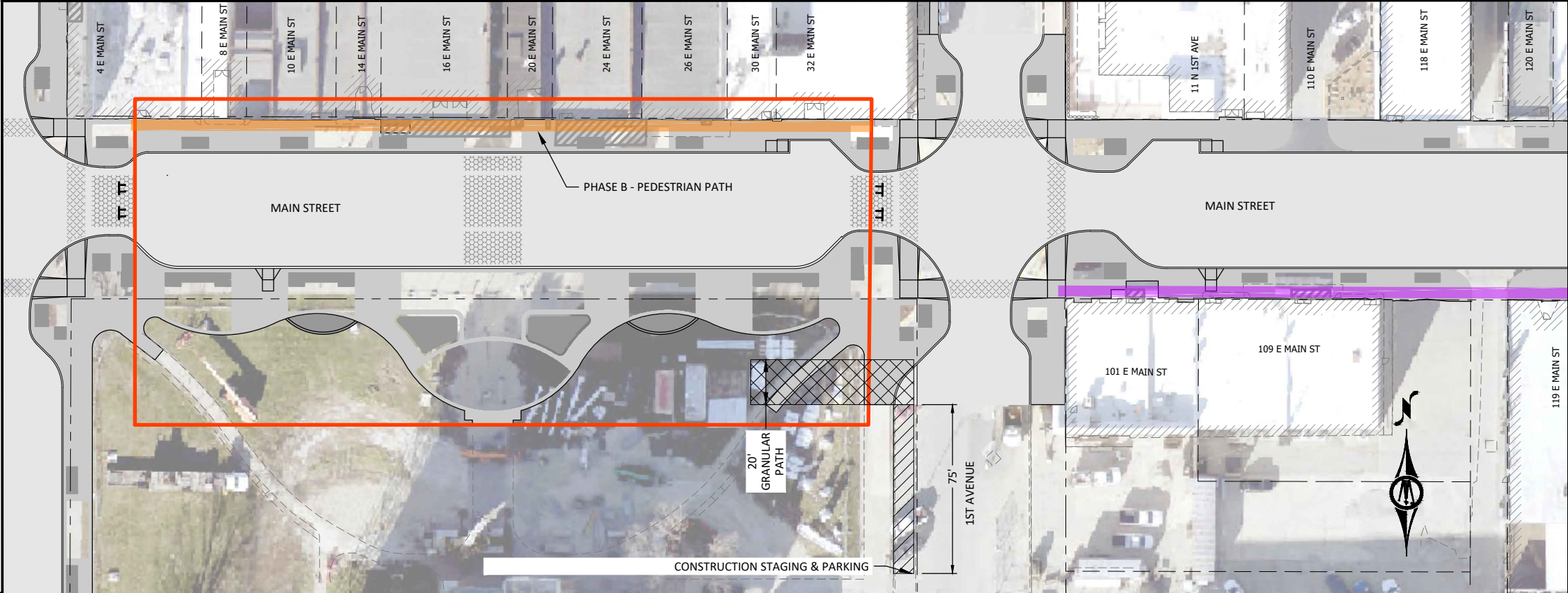
- PHASE 2B NOTES:
- 1) INSTALL TEMPORARY CONSTRUCTION FENCE ON ONE SIDE OF THE STREET AND ALLOW CONSTRUCTION ON SIDEWALKS ON OTHER SIDE OF THE STREET. FENCE SHALL BE INCIDENTAL TO TRAFFIC CONTROL AND NOT MEASURED FOR PAYMENT.
 - 2) CONTRACTOR SHALL PROVIDE TEMPORARY PEDESTRIAN ACCESS FROM OPEN SIDEWALK ACROSS THE STREET TO ALL FRONT DOORS INSIDE THE CONSTRUCTION ZONE. CONTRACTOR SHALL PROVIDE ACCESS AT ALL TIME UNLESS UNFEASIBLE DUE TO WORK DIRECTLY IN FRONT OF THE BUSINESS FRONT DOOR.
 - 3) CONSTRUCTION IS ESTIMATED TO BE COMPLETED AS FOLLOWS.
 - a) REMOVAL OF ALL SIDEWALK ALONG ENTIRE BLOCK. (MAXIMUM OF 1 DAY BUSINESS IMPACT FOR SIDEWALK REMOVAL)
 - i) CONTRACTOR SHALL COORDINATE WITH PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO IMPACT.
 - b) INSTALLATION OF GRANULAR PEDESTRIAN PATH. PATH SHALL EITHER DIRECT PEDESTRIAN LONGITUDINALLY ALONG BUILDING FRONTAGES TO EACH END OF THE BLOCK OR PERPENDICULARLY ACROSS THE STREET TO PROTECTED PEDESTRIAN ACCESS PATH ON OTHER SIDE OF THE STREET. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND CITY STAFF PRIOR TO SIDEWALK REMOVAL TO CONFIRM PEDESTRIAN ACCESS APPROACH.
 - 4) INSTALL DRIVEWAYS, SIDEWALKS, AND PAVERS.
 - a) LIMIT PROPERTY IMPACTS/NON-ACCESS TO THE FOLLOWING TIME LIMITATIONS DURING SIDEWALK CONSTRUCTION.
 - i) MAXIMUM OF 1 DAY FOR PAVING PREPARATION FOR SIDEWALKS
 - ii) MAXIMUM OF 1 DAY FOR SIDEWALK POURING
 - iii) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE PAVING PREPARATION
 - iv) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE POURING
 - v) MAXIMUM OF 1 DAY FOR PAVER INSTALLATION.
 - 5) PROPERTIES SHALL BE IMPACTED FOR A MAXIMUM OF 2 CONSECUTIVE DAYS UNLESS PREVIOUSLY DISCUSSED WITH THE PROPERTY OWNER AND APPROVAL IS OBTAINED BY THE CONTRACTOR IN WRITING.
 - 6) ACCESS TO THE PROPERTY SHALL BE REESTABLISHED TO FRONT DOOR AFTER IMPACTED DAYS THROUGH USE OF TEMPORARY GRANULAR MATERIAL OR TEMPORARY ADA ACCESSIBLE WALKWAY CONSTRUCTED OF STURDY MATERIALS. ALL WALKWAY MATERIALS MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. TEMPORARY GRANULAR MATERIAL OR WALKWAY SHALL BE INCIDENTAL TO PEDESTRIAN TRAFFIC CONTROL. NO ADDITIONAL PAYMENT SHALL BE MADE.
 - 7) UPON COMPLETION OF SIDEWALK ON ONE SIDE OF THE STREET THE CONTRACTOR CAN MOVE TO THE OTHER SIDE OF THE STREET. PAVER AND PLANTING AREAS DO NOT HAVE TO BE COMPLETED TO MOVE TO THE SIDE OF THE STREET. IF PAVER OR LANDSCAPING BEDS ARE NOT COMPLETED, THEY MUST BE FILLED WITH GRANULAR MATERIAL PRIOR TO MOVING TO OTHER SIDE OF THE STREET.
 - 8) WHEN PAVERS AND LANDSCAPING AREAS ARE COMPLETED THE CONTRACTOR SHALL MINIMIZE IMPACT TO BUSINESSES AND LIMIT IMPACT TO A MAXIMUM OF 1 DAY PER BUSINESS WITH AT LEAST 48 HOURS' NOTICE. CONTRACTOR SHALL ALSO PROVIDE TEMPORARY CONSTRUCTION FENCING AROUND AREA TO PROTECT PEDESTRIANS.



A
J.08

SUB-PHASE A - PEDESTRIAN ACCESS - MAINLINE/PARKING CONSTRUCTION

NOT TO SCALE



B
J.08

SUB-PHASE B - PEDESTRIAN ACCESS - SIDEWALK CONSTRUCTION

NOT TO SCALE

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CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

STAGING AND TRAFFIC CONTROL

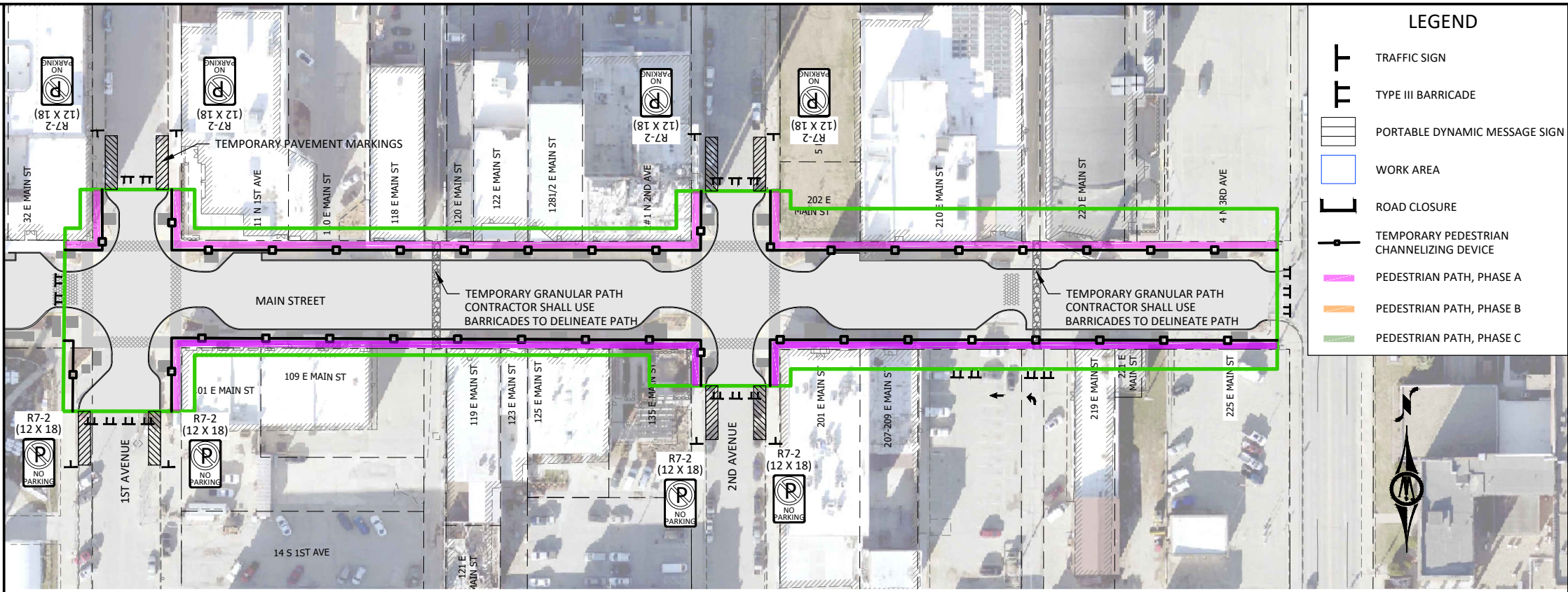
SHEET

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- PHASE 3 NOTES:
- INSTALL PDMS 7 DAYS IN ADVANCE OF CLOSURE (ONE NB AND ONE SB ON CENTER STREET)
 - INSTALL TEMPORARY TRAFFIC CONTROL INCLUDING TEMPORARY PAVEMENT MARKINGS
 - ALL WORK MUST BE COMPLETED, EXCEPT ITEMS WAITING FOR A PLANTING WINDOW, PRIOR TO COMMENCING NEXT PHASE.
 - ROAD CLOSURES INCLUDE ENOUGH TYPE III BARRICADES TO CLOSE THE ROAD FROM CURB TO CURB.
 - PHASE 3.1 (THE INTERSECTION OF MAIN STREET AND 1ST STREET SHALL BE COMPLETED AS QUICKLY AS POSSIBLE DURING PHASES 3. REFER TO INTERMEDIATE COMPLETION PROVISION 3 IN THE SPECIFICATIONS FOR TIMING AND LIQUIDATED DAMAGES.
 - PHASE 3.1 AND 3.2 MAY BE COMPLETED CONCURRENTLY AS LONG AS PHASE 3.1 IS COMPLETED WITHIN THE TIMING PROVIDED IN THE SPECIFICATIONS.

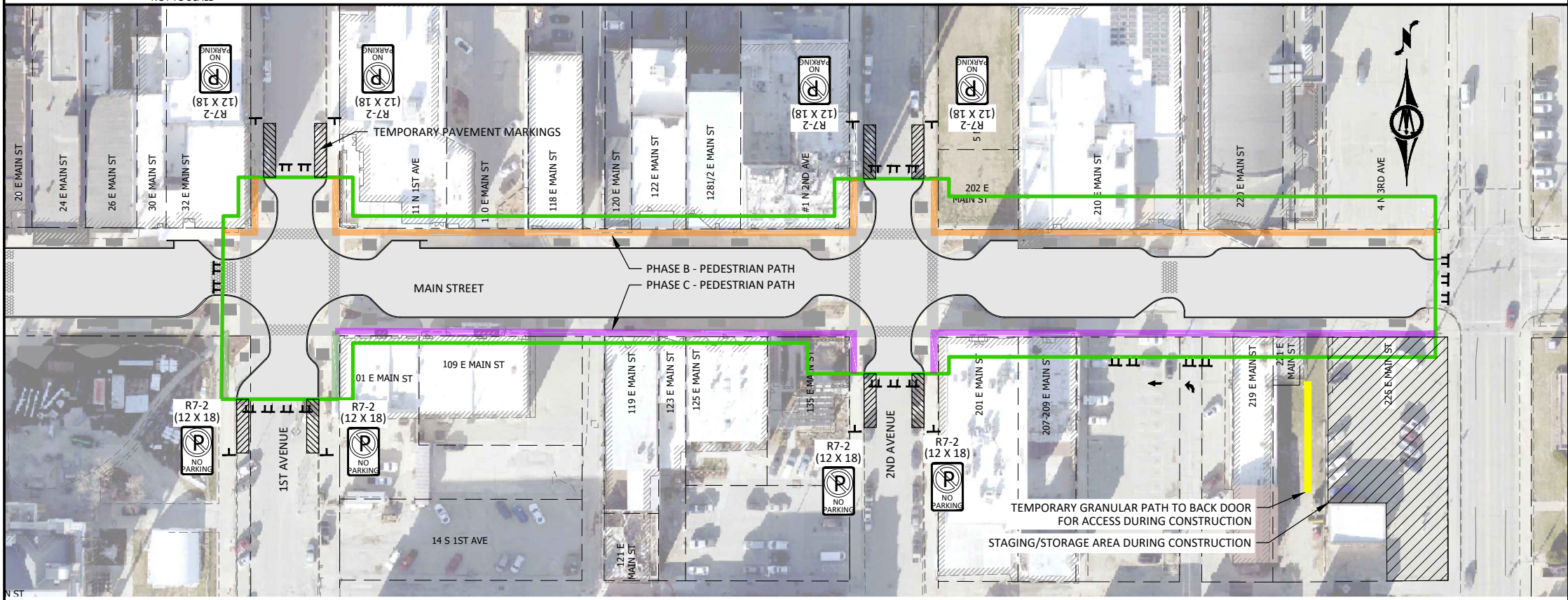
- PHASE 3A NOTES:
- 1) INSTALL TEMPORARY PEDESTRIAN TRAFFIC CONTROL INCLUDING TEMPORARY PEDESTRIAN CHANNELIZATION DEVICES
 - 2) SAWCUT AND REMOVE EXISTING STREET PAVEMENT
 - 3) INSTALL NEW WATER MAIN, STORM SEWER AND IRRIGATION.
 - 4) INSTALL UTILITY SERVICES TO EACH BUILDING.
 - a) CONTRACTOR SHALL COORDINATE WITH EACH PROPERTY TO PROVIDE A MINIMUM 48 HOUR NOTICE FOR CLOSURE OF FRONT DOOR IF UTILITY CONNECTION AFFECTS ACCESS.
 - b) EACH UTILITY CONNECTION SHALL CLOSE BUSINESS FOR A MAXIMUM OF 2 DAYS.
 - c) AFTER COMPLETION OF UTILITY CONNECTIONS CONTRACTOR SHALL REESTABLISH SIDEWALK WITH USE OF TEMPORARY GRANULAR MATERIAL. NO ADDITIONAL PAYMENT FOR TEMPORARY GRANULAR MATERIAL SHALL BE MADE.
 - 6) GRADING, SUBBASE PREPARATION, GEOGRID INSTALLATION
 - 7) PAVING PREPARATION AND STREET PAVING,
 - 8) PARKING LANE PAVING
 - 9) PAVE PORTION OF SIDEWALK IF ADEQUATE ROOM TO ALLOW PEDESTRIAN ACCESS ROUTE TO REMAIN.

- PHASE 3B/C NOTES:
- 1) INSTALL TEMPORARY CONSTRUCTION FENCE ON ONE SIDE OF THE STREET AND ALLOW CONSTRUCTION ON SIDEWALKS ON OTHER SIDE OF THE STREET. FENCE SHALL BE INCIDENTAL TO TRAFFIC CONTROL AND NOT MEASURED FOR PAYMENT.
 - 2) CONTRACTOR SHALL PROVIDE TEMPORARY PEDESTRIAN ACCESS FROM OPEN SIDEWALK ACROSS THE STREET TO ALL FRONT DOORS INSIDE THE CONSTRUCTION ZONE. CONTRACTOR SHALL PROVIDE ACCESS AT ALL TIME UNLESS UNFEASIBLE DUE TO WORK DIRECTLY IN FRONT OF THE BUSINESS FRONT DOOR.
 - 3) CONSTRUCTION IS ESTIMATED TO BE COMPLETED AS FOLLOWS.
 - a) REMOVAL OF ALL SIDEWALK ALONG ENTIRE BLOCK. (MAXIMUM OF 1 DAY BUSINESS IMPACT FOR SIDEWALK REMOVAL)
 - i) CONTRACTOR SHALL COORDINATE WITH PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO IMPACT.
 - b) INSTALLATION OF GRANULAR PEDESTRIAN PATH. PATH SHALL EITHER DIRECT PEDESTRIAN LONGITUDINALLY ALONG BUILDING FRONTAGES TO EACH END OF THE BLOCK OR PERPENDICULARLY ACROSS THE STREET TO PROTECTED PEDESTRIAN ACCESS PATH ON OTHER SIDE OF THE STREET. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND CITY STAFF PRIOR TO SIDEWALK REMOVAL TO CONFIRM PEDESTRIAN ACCESS APPROACH.
 - 4) INSTALL DRIVEWAYS, SIDEWALKS, AND PAVERS.
 - a) LIMIT PROPERTY IMPACTS/NON-ACCESS TO THE FOLLOWING TIME LIMITATIONS DURING SIDEWALK CONSTRUCTION.
 - i) MAXIMUM OF 1 DAY FOR PAVING PREPARATION FOR SIDEWALKS
 - ii) MAXIMUM OF 1 DAY FOR SIDEWALK POURING
 - iii) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE PAVING PREPARATION
 - iv) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE POURING
 - v) MAXIMUM OF 1 DAY FOR PAVER INSTALLATION.
 - 5) PROPERTIES SHALL BE IMPACTED FOR A MAXIMUM OF 2 CONSECUTIVE DAYS UNLESS PREVIOUSLY DISCUSSED WITH THE PROPERTY OWNER AND APPROVAL IS OBTAINED BY THE CONTRACTOR IN WRITING.
 - 6) ACCESS TO THE PROPERTY SHALL BE REESTABLISHED TO FRONT DOOR AFTER IMPACTED DAYS THROUGH USE OF TEMPORARY GRANULAR MATERIAL OR TEMPORARY ADA ACCESSIBLE WALKWAY CONSTRUCTED OF STURDY MATERIALS. ALL WALKWAY MATERIALS MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. TEMPORARY GRANULAR MATERIAL OR WALKWAY SHALL BE INCIDENTAL TO PEDESTRIAN TRAFFIC CONTROL. NO ADDITIONAL PAYMENT SHALL BE MADE.
 - 7) UPON COMPLETION OF SIDEWALK ON ONE SIDE OF THE STREET THE CONTRACTOR CAN MOVE TO THE OTHER SIDE OF THE STREET. PAVER AND PLANTING AREAS DO NOT HAVE TO BE COMPLETED TO MOVE TO THE SIDE OF THE STREET. IF PAVER OR LANDSCAPING BEDS ARE NOT COMPLETED, THEY MUST BE FILLED WITH GRANULAR MATERIAL PRIOR TO MOVING TO OTHER SIDE OF THE STREET.
 - 8) WHEN PAVERS AND LANDSCAPING AREAS ARE COMPLETED, THE CONTRACTOR SHALL MINIMIZE IMPACT TO BUSINESSES AND LIMIT IMPACT TO A MAXIMUM OF 1 DAY PER BUSINESS WITH AT LEAST 48 HOURS NOTICE. CONTRACTOR SHALL ALSO PROVIDE TEMPORARY CONSTRUCTION FENCING AROUND AREA TO PROTECT PEDESTRIANS.



PHASE 3.1 - SUB-PHASE A - PEDESTRIAN ACCESS - MAINLINE/PARKING CONSTRUCTION

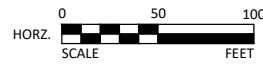
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PHASE 3.1 - SUB-PHASE B/C - PEDESTRIAN ACCESS - SIDEWALK CONSTRUCTION

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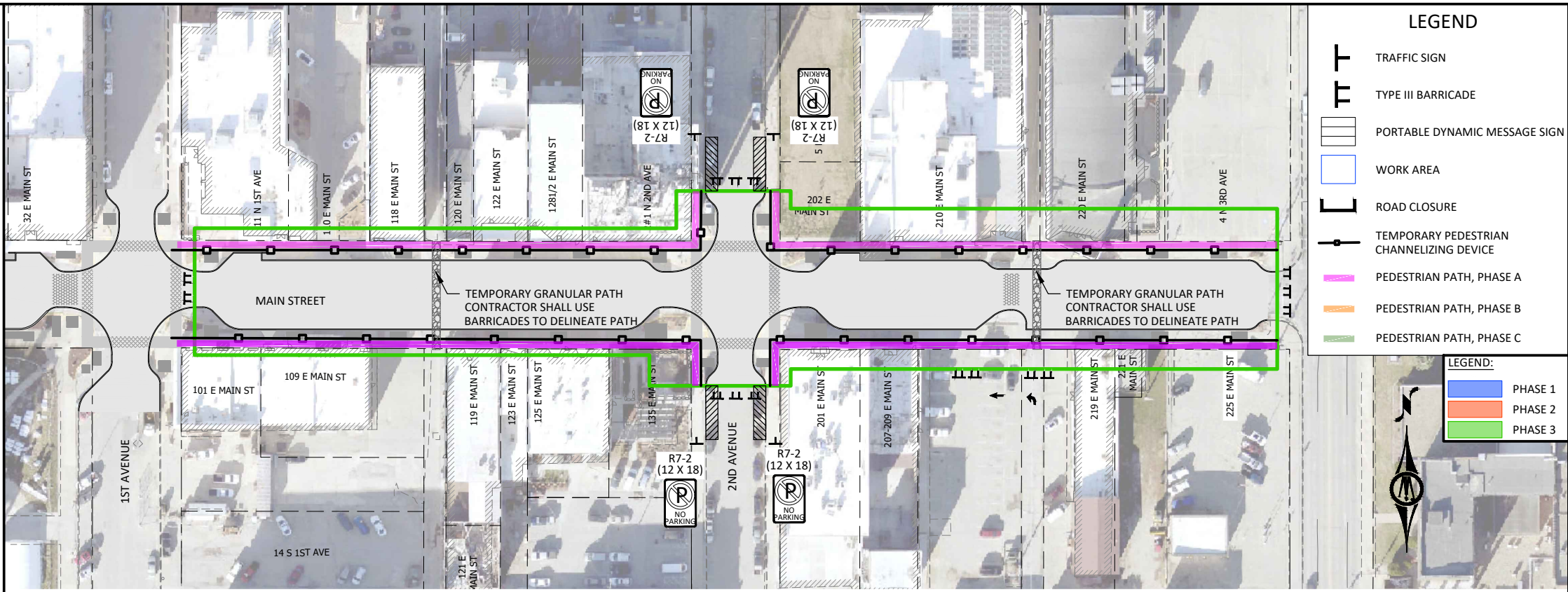


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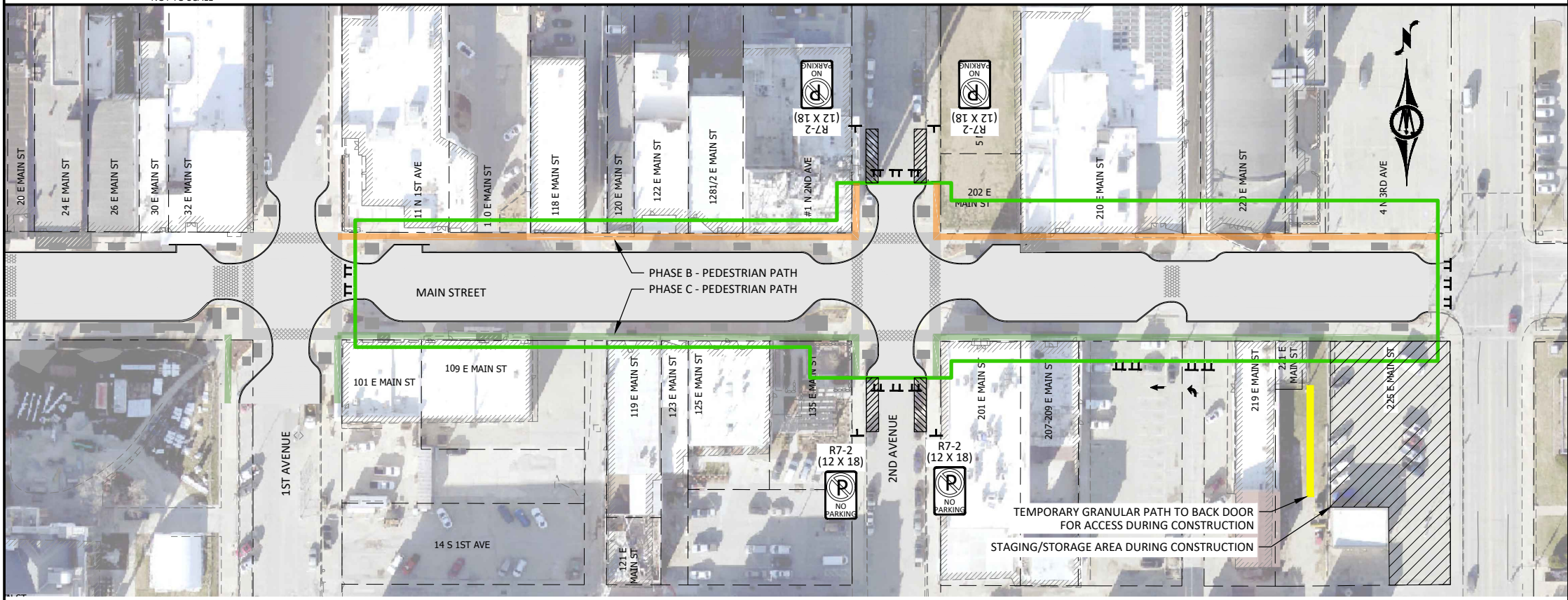
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

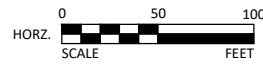
- PHASE 3 NOTES:
- INSTALL PDMS 7 DAYS IN ADVANCE OF CLOSURE (ONE NB AND ONE SB ON CENTER STREET)
 - INSTALL TEMPORARY TRAFFIC CONTROL INCLUDING TEMPORARY PAVEMENT MARKINGS
 - ALL WORK MUST BE COMPLETED, EXCEPT ITEMS WAITING FOR A PLANTING WINDOW, PRIOR TO COMMENCING NEXT PHASE.
 - ROAD CLOSURES INCLUDE ENOUGH TYPE III BARRICADES TO CLOSE THE ROAD FROM CURB TO CURB.
 - PHASE 3.1 (THE INTERSECTION OF MAIN STREET AND 1ST STREET SHALL BE COMPLETED AS QUICKLY AS POSSIBLE DURING PHASES 3. REFER TO INTERMEDIATE COMPLETION PROVISION 3 IN THE SPECIFICATIONS FOR TIMING AND LIQUIDATED DAMAGES.
 - PHASE 3.1 AND 3.2 MAY BE COMPLETED CONCURRENTLY AS LONG AS PHASE 3.1 IS COMPLETED WITHIN THE TIMING PROVIDED IN THE SPECIFICATIONS.
- PHASE 3A NOTES:
- 1) INSTALL TEMPORARY PEDESTRIAN TRAFFIC CONTROL INCLUDING TEMPORARY PEDESTRIAN CHANNELIZATION DEVICES
 - 2) SAWCUT AND REMOVE EXISTING STREET PAVEMENT
 - 3) INSTALL NEW WATER MAIN, STORM SEWER AND IRRIGATION.
 - 4) INSTALL UTILITY SERVICES TO EACH BUILDING.
 - a) CONTRACTOR SHALL COORDINATE WITH EACH PROPERTY TO PROVIDE A MINIMUM 48 HOUR NOTICE FOR CLOSURE OF FRONT DOOR IF UTILITY CONNECTION AFFECTS ACCESS.
 - b) EACH UTILITY CONNECTION SHALL CLOSE BUSINESS FOR A MAXIMUM OF 2 DAYS.
 - c) AFTER COMPLETION OF UTILITY CONNECTIONS CONTRACTOR SHALL REESTABLISH SIDEWALK WITH USE OF TEMPORARY GRANULAR MATERIAL. NO ADDITIONAL PAYMENT FOR TEMPORARY GRANULAR MATERIAL SHALL BE MADE.
 - 6) GRADING, SUBBASE PREPARATION, GEOGRID INSTALLATION
 - 7) PAVING PREPARATION AND STREET PAVING,
 - 8) PARKING LANE PAVING
 - 9) PAVE PORTION OF SIDEWALK IF ADEQUATE ROOM TO ALLOW PEDESTRIAN ACCESS ROUTE TO REMAIN.
- PHASE 3B/C NOTES:
- 1) INSTALL TEMPORARY CONSTRUCTION FENCE ON ONE SIDE OF THE INTERSECTION AND ALLOW CONSTRUCTION ON QUADRANTS ON OTHER SIDE OF THE STREET. FENCE SHALL BE INCIDENTAL TO TRAFFIC CONTROL AND NOT MEASURED FOR PAYMENT.
 - 2) CONSTRUCTION IS ESTIMATED TO BE COMPLETED AS FOLLOWS.
 - a) REMOVAL OF ALL SIDEWALK ALONG IN THE INTERSECTION. (MAXIMUM OF 1 DAY BUSINESS IMPACT FOR SIDEWALK REMOVAL)
 - i) CONTRACTOR SHALL COORDINATE WITH PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO IMPACT.
 - b) INSTALLATION OF GRANULAR PEDESTRIAN PATH. PATH SHALL EITHER DIRECT PEDESTRIAN LONGITUDINALLY ALONG BUILDING FRONTAGES TO EACH END OF THE BLOCK OR PERPENDICULARLY ACROSS THE INTERSECTION TO PROTECTED PEDESTRIAN ACCESS PATH ON OTHER SIDE OF THE STREET. CONTRACTOR SHALL COORDINATE WITH ENGINEER AND CITY STAFF PRIOR TO SIDEWALK REMOVAL TO CONFIRM PEDESTRIAN ACCESS APPROACH.
 - 3) INSTALL SIDEWALKS AND PAVERS.
 - a) LIMIT PROPERTY IMPACTS/NON-ACCESS TO THE FOLLOWING TIME LIMITATIONS DURING SIDEWALK CONSTRUCTION.
 - i) MAXIMUM OF 1 DAY FOR PAVING PREPARATION FOR SIDEWALKS
 - ii) MAXIMUM OF 1 DAY FOR SIDEWALK POURING
 - iii) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE PAVING PREPARATION
 - iv) MAXIMUM OF 1 DAY FOR PAVER CONCRETE SUBBASE POURING
 - v) MAXIMUM OF 1 DAY FOR PAVER INSTALLATION.
 - 4) PROPERTIES SHALL BE IMPACTED FOR A MAXIMUM OF 2 CONSECUTIVE DAYS UNLESS PREVIOUSLY DISCUSSED WITH THE PROPERTY OWNER AND APPROVAL IS OBTAINED BY THE CONTRACTOR IN WRITING.
 - 5) ACCESS TO THE PROPERTY SHALL BE REESTABLISHED TO FRONT DOOR AFTER IMPACTED DAYS THROUGH USE OF TEMPORARY GRANULAR MATERIAL OR TEMPORARY ADA ACCESSIBLE WALKWAY CONSTRUCTED OF STURDY MATERIALS. ALL WALKWAY MATERIALS MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. TEMPORARY GRANULAR MATERIAL OR WALKWAY SHALL BE INCIDENTAL TO PEDESTRIAN TRAFFIC CONTROL. NO ADDITIONAL PAYMENT SHALL BE MADE.
 - 6) UPON COMPLETION OF SIDEWALK ON ONE SIDE OF THE INTERSECTION THE CONTRACTOR CAN MOVE TO THE OTHER SIDE OF THE INTERSECTION. PAVER AND PLANTING AREAS DO NOT HAVE TO BE COMPLETED TO MOVE TO THE SIDE OF THE INTERSECTION. IF PAVER OR LANDSCAPING BEDS ARE NOT COMPLETED, THEY MUST BE FILLED WITH GRANULAR MATERIAL PRIOR TO MOVING TO OTHER SIDE OF THE INTERSECTION OR FENCED/BARRICADED OFF AS LONG AS A 5' WALKABLE PATH IS MAINTAINED.
 - 7) WHEN PAVERS AND LANDSCAPING AREAS ARE COMPLETED, THE CONTRACTOR SHALL MINIMIZE IMPACT TO BUSINESSES AND LIMIT IMPACT TO A MAXIMUM OF 1 DAY PER BUSINESS WITH AT LEAST 48 HOURS NOTICE. CONTRACTOR SHALL ALSO PROVIDE TEMPORARY CONSTRUCTION FENCING AROUND AREA TO PROTECT PEDESTRIANS.



A
J.10
NOT TO SCALE
PHASE 3.2 - SUB-PHASE A - PEDESTRIAN ACCESS - MAINLINE/PARKING CONSTRUCTION



B
J.10
NOT TO SCALE
PHASE 3.2 - SUB-PHASE B/C - PEDESTRIAN ACCESS - SIDEWALK CONSTRUCTION



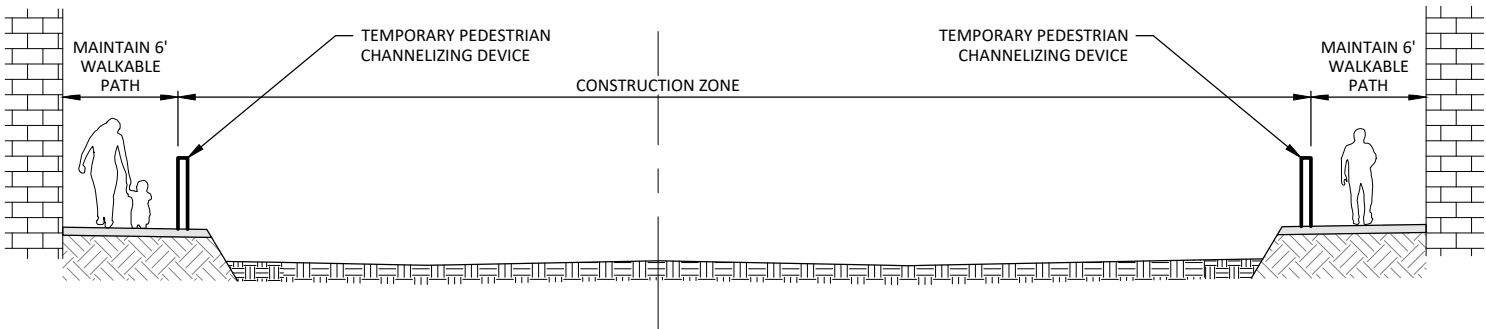
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

PEDESTRIAN TRAFFIC CONTROL NOTES:

- 1) CONTRACTOR SHALL PROVIDE DEDICATED PEDESTRIAN TRAFFIC CONTROL DURING THE PROJECT.
- 2) EACH PHASE SHALL BE BROKEN INTO TWO SUB PHASES IN REGARD TO PEDESTRIAN ACCESS, SUBPHASE A AND SUBPHASE B.
- 3) DURING SUBPHASE A PEDESTRIAN ACCESS SHALL BE PROVIDED ADJACENT TO THE EXISTING BUILDING WITH A MINIMUM WALKABLE PATH OF 6' WITH TEMPORARY PEDESTRIAN CHANNELIZATION DEVICES INSTALLED TO SEPARATE PEDESTRIAN TRAFFIC FROM CONSTRUCTION TRAFFIC. CONTRACTOR SHALL MAINTAIN TEMPORARY PEDESTRIAN CHANNELIZATION DEVICE DURING EACH PHASE.
- 4) SUBPHASE A SHALL INCLUDE CONSTRUCTION OF ALL UTILITIES, ROADWAY PAVING, PARKING LANES AND SMALL SECTIONS OF SIDEWALK DEPENDING ON SPACE CONSTRAINTS.
- 5) DURING SUBPHASE A IT MAY BE NECESSARY TO RESTRICT ACCESS TO BUSINESSES DUE TO UTILITY SERVICE REPLACEMENTS OR VAULT REPAIRS. MULTIPLE BUSINESS ACCESS RESTRICTIONS OR CLOSURES SHALL NOT OCCUR AT THE SAME TIME DURING SUBPHASE A OF ANY PHASE WITHOUT PRIOR AUTHORIZATION FROM CITY OF MARSHALLTOWN.
- 6) IF A BUSINESS ACCESS IS CLOSED FOR UTILITY WORK DURING SUBPHASE A IT SHALL BE CLOSED FOR A MAXIMUM OF 1 DAY. CONTRACTOR SHALL PROVIDE A MINIMUM 48 HOUR NOTICE TO THE BUSINESS PRIOR TO CLOSURE.
- 7) AT THE END OF THE TEMPORARY CLOSURE PEDESTRIAN ACCESS SHALL BE RESTORED AND TEMPORARY PEDESTRIAN CHANNELIZATION DEVICES PUT BACK IN PLACE. TEMPORARY GRANULAR SIDEWALK SHALL BE UTILIZED TO PROVIDE ACCESS AFTER SIDEWALK IS REMOVED.
- 8) SUBPHASE B SHALL INCLUDE CONSTRUCTION OF SIDEWALK, PAVER BEDS AND PLANTER BEDS.
- 9) DURING SUBPHASE B & C PEDESTRIAN ACCESS SHALL BE MAINTAINED AS SHOWN.
- 10) DURING SUBPHASE B, BUSINESS ACCESS IS ANTICIPATED TO BE DISTURBED UP TO 3 TIMES FOR NORMAL SIDEWALK AND 5 TIMES FOR BUSINESSES WITH PAVERS DIRECTLY ADJACENT TO THEIR DOOR.
- 11) FOR NORMAL SIDEWALK, THE BUSINESS CAN BE CLOSED UP TO 1 DAY FOR REMOVALS, 1 DAY FOR PAVEMENT PREP AND 1 DAY FOR PAVING WITH A MAXIMUM OF 2 CONSECUTIVE DAYS IN A ROW FOR A BUSINESS CLOSURE. CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS USING EITHER TEMPORARY GRANULAR MATERIAL OR A WALKBRIDGE AT LEAST 48" WIDE WITH HANDRAILS IN BETWEEN CLOSURES. TEMPORARY ACCESS SHALL BE INCIDENTAL TO PEDESTRIAN TRAFFIC CONTROL.
- 12) FOR BUSINESSES WITH PAVER BEDS IN FRONT OF THEM, BUSINESSES CAN BE CLOSED UP TO 1 DAY FOR REMOVALS, 1 DAY FOR PAVING PREP, 1 DAY FOR SIDEWALK POUR, 1 DAY FOR PAVER BED PAVING AND 1 DAY FOR SETTING PAVERS WITH A MAXIMUM OF 2 CONSECUTIVE DAYS IN A ROW FOR A BUSINESS CLOSURE. CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS THROUGH EITHER TEMPORARY GRANULAR MATERIAL OR WALKBRIDGE AT LEAST 48" WIDE IN BETWEEN CLOSURES. TEMPORARY ACCESS SHALL BE INCIDENTAL SHALL BE INCIDENTAL TO PEDESTRIAN TRAFFIC CONTROL.

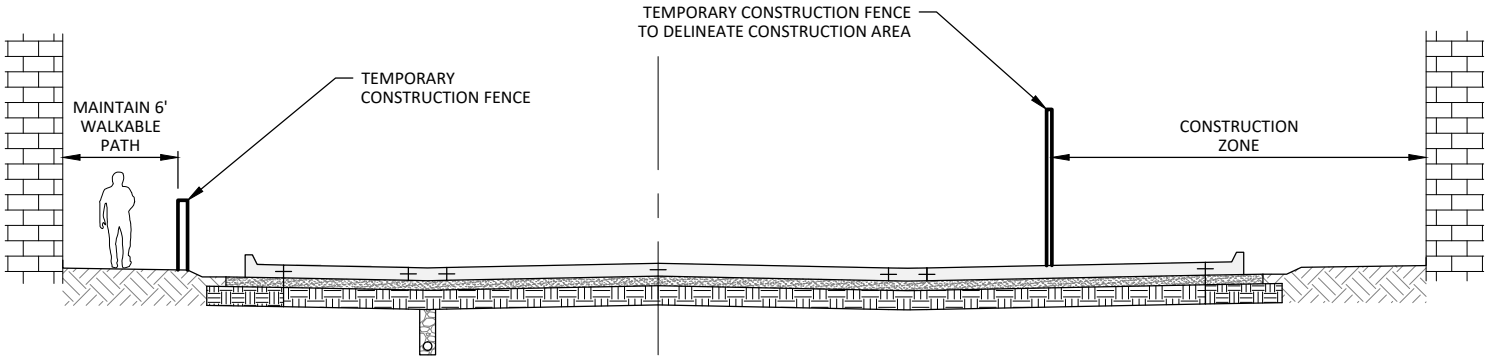


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J.09
SUB-PHASE A - PEDESTRIAN ACCESS - MAINLINE CONSTRUCTION

NOT TO SCALE

NOTE:

- 1) CONTRACTOR SHALL PROVIDE PEDESTRIAN ACCESS PATHS FROM WALKABLE PATH TO BUILDING ENTRIES IN CONSTRUCTION ZONE

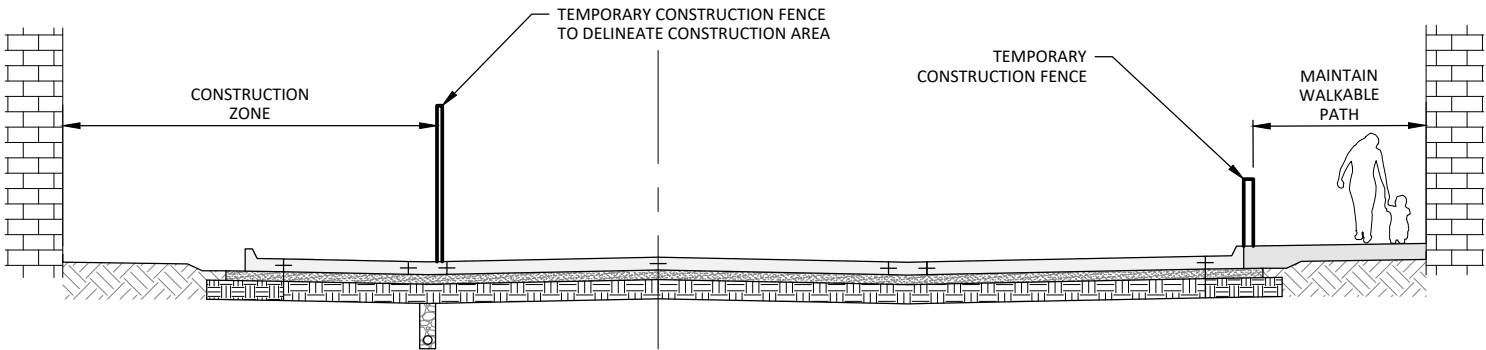


2
J.11
SUB-PHASE B - PEDESTRIAN ACCESS - PARKING AND SIDEWALK CONSTRUCTION

NOT TO SCALE

NOTE:

- 1) CONTRACTOR SHALL PROVIDE PEDESTRIAN ACCESS PATHS FROM WALKABLE PATH TO BUILDING ENTRIES IN CONSTRUCTION ZONE



1
J.11
SUB-PHASE C - PEDESTRIAN ACCESS - PARKING AND SIDEWALK CONSTRUCTION

NOT TO SCALE



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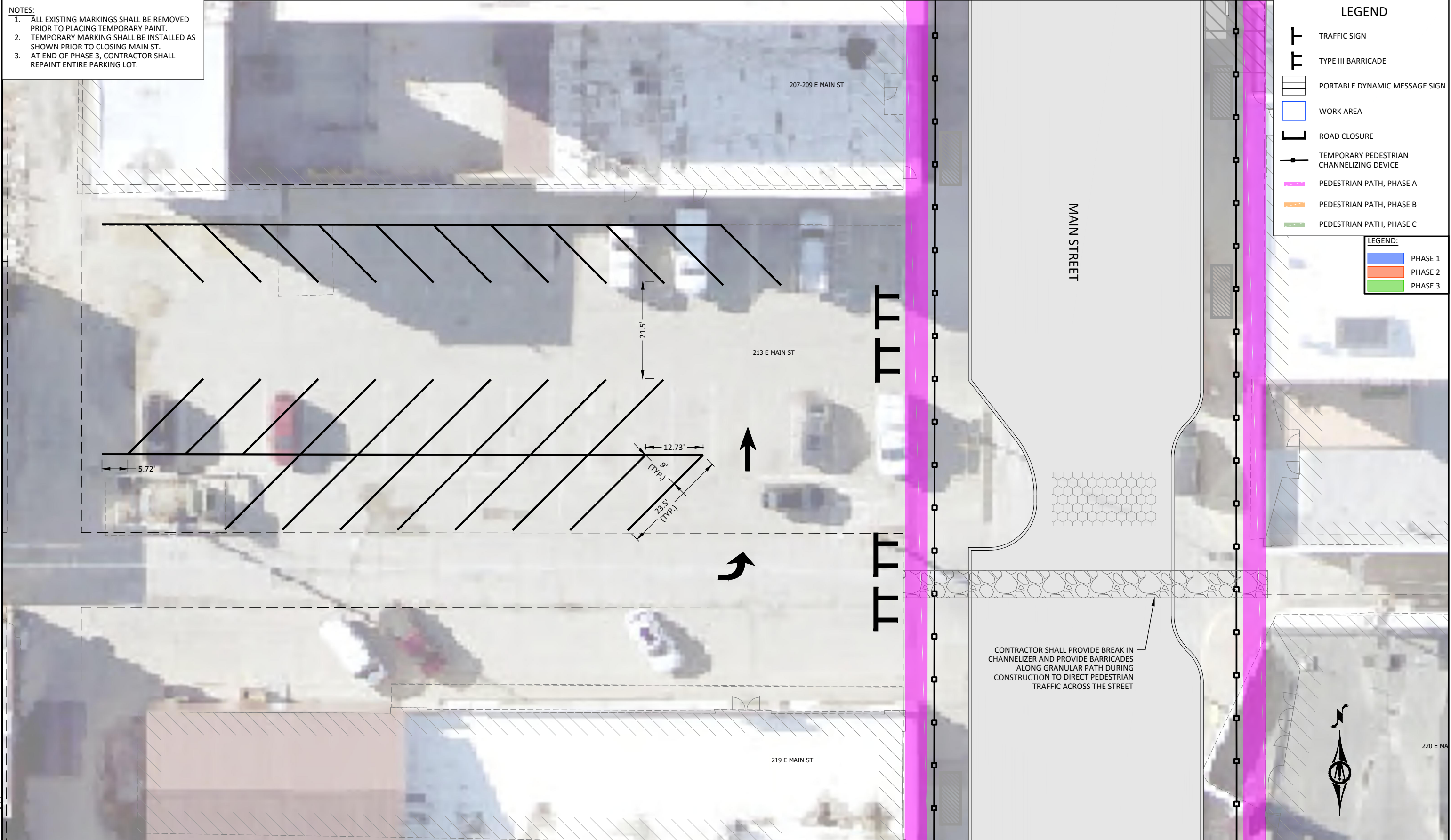
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

SHEET

J.11

- NOTES:
1. ALL EXISTING MARKINGS SHALL BE REMOVED PRIOR TO PLACING TEMPORARY PAINT.
 2. TEMPORARY MARKING SHALL BE INSTALLED AS SHOWN PRIOR TO CLOSING MAIN ST.
 3. AT END OF PHASE 3, CONTRACTOR SHALL REPAINT ENTIRE PARKING LOT.



LEGEND

- TRAFFIC SIGN
- TYPE III BARRICADE
- PORTABLE DYNAMIC MESSAGE SIGN
- WORK AREA
- ROAD CLOSURE
- TEMPORARY PEDESTRIAN CHANNELIZING DEVICE
- PEDESTRIAN PATH, PHASE A
- PEDESTRIAN PATH, PHASE B
- PEDESTRIAN PATH, PHASE C

LEGEND:

- PHASE 1
- PHASE 2
- PHASE 3

PARKING LOT N - TEMPORARY STRIPING DURING PHASE 3 CONSTRUCTION



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STAGING AND TRAFFIC CONTROL

SHEET
J.12

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GENERAL NOTES:

1. UNDERGROUND UTILITIES: FIELD LOCATE UNDERGROUND UTILITIES PRIOR TO EXCAVATION FOR INSTALLATION OF SITE IMPROVEMENTS. IF A CONFLICT EXISTS BETWEEN PROPOSED SITE IMPROVEMENTS AND EXISTING OR PROPOSED UTILITIES, IMMEDIATELY ADVISE THE OWNERS REPRESENTATIVE.
2. SPOT ELEVATIONS WHERE SHOWN ON THESE DRAWINGS ARE TO THE TOP OF FINISH SURFACES.
3. DIMENSIONS: DIMENSIONS ARE FROM BACK OF CURB UNLESS NOTED OR SHOWN OTHERWISE ON THE DRAWINGS.
4. HORIZONTAL CONTROL: HORIZONTAL CONTROL FOR THE LAYOUT OF SITE IMPROVEMENTS WILL BE PROVIDED BY THE ENGINEER. STATIONS AND OFFSETS INDICATED ON THE DRAWINGS ARE RELATIVE TO THE ROADWAY STATIONING.
5. ISOLATION JOINTS IN SIDEWALK PAVING: GENERALLY, ISOLATION JOINTS WILL BE LOCATED ALONG THE BACK OF CURB BETWEEN SIDEWALK PAVEMENTS AND PERMANENT STRUCTURES, WALLS AND BUILDINGS. ISOLATION JOINTS WILL ALSO BE LOCATED WHERE THE SIDEWALK PAVEMENT TURNS OR CHANGES DIRECTION, AND AT EVERY 100 FOOT MARK OF LINEAR SIDEWALK.
6. ALL SIDEWALKS AND CONCRETE SURFACES TO HAVE A LIGHT BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL UNLESS OTHERWISE NOTED, TYPICAL.
7. SAWCUTS TO BE MADE AS SHOWN ON PLANS UNLESS DIRECTED OTHERWISE BY OWNERS REP.
8. CONTRACTOR IS TO PRESERVE AND PROTECT EXISTING VEGETATION TO REMAIN AT ALL STAGES OF CONSTRUCTION. DAMAGED PLANT MATERIAL WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
9. CONTRACTOR IS TO PRESERVE AND PROTECT EXISTING BUILDINGS AND FOUNDATIONS AT ALL STAGES OF CONSTRUCTION.
10. CONTRACTOR IS TO VERIFY THAT ALL SLOPES, CROSS SLOPES, LONGITUDINAL SLOPES, DROP CURB SLOPES, ETC. DO NOT EXCEED PROWAG MAXIMUMS. CONTRACTOR IS TO NOTIFY OWNER'S REPRESENTATIVE IF SLOPES EXCEED GUIDELINE RECOMMENDATIONS.
11. HATCH PATTERNS ON PLAN DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION OR SCALING PURPOSES. REFER TO CONSTRUCTION DETAILS FOR PAVER PATTERNS AND FINISHES.

CONCRETE UNIT PAVER PRODUCT INFORMATION:

SIDEWALK UNIT PAVERS (PATTERN 'A'):

TYPE: UNILOCK - ARTLINE, 7 CM THICK
FINISH: SMOOTH PREMIER
COLORS: +/- 38% FOSSIL, +/-30% BAVARIAN, +/- 32% MIDNIGHT SKY
PATTERN SHOWN ON SHEETS K.01 - K.09 FOR DESIGN INTENT ONLY.
CONTRACTOR RESPONSIBLE FOR FINAL LAYOUT AS SHOWN ON PLANS AND DETAILS. LANDSCAPE ARCHITECT TO REVIEW AND APPROVE LAYOUT IN FIELD.

SIDEWALK UNIT PAVERS (PATTERN 'B'):

TYPE: UNILOCK - ARTLINE, 7 CM THICK
FIINISH: SMOOTH PREMIER
COLORS: +/- 25% FOSSIL, +/-50% BAVARIAN, +/-25% MIDNIGHT SKY
PATTERN SHOWN ON SHEETS K.01 - K.09 FOR DESIGN INTENT ONLY.
CONTRACTOR RESPONSIBLE FOR FINAL LAYOUT AS SHOWN ON PLANS AND DETAILS. LANDSCAPE ARCHITECT TO REVIEW AND APPROVE LAYOUT IN FIELD.

ROADWAY UNIT PAVERS:

TYPE: UNILOCK - ARTLINE, 8 CM THICK
FINISH: SMOOTH PREMIER
COLOR: MIDNIGHT SKY

CROSSWALK UNIT PAVERS:

TYPE: UNILOCK - HOLLAND PREMIER, 8CM THICK, HERRINGBONE PATTERN
FINISH: SMOOTH PREMIER
COLOR: DARK CHARCOAL

CONTACT: TJ WEINANDT (402-630-3884) TJ.WEINANDT@UNILOCK.COM

OR APPROVED EQUAL

PLANT SCHEDULE

CANOPY TREES	QTY	UNIT	BOTANICAL NAME	COMMON NAME	CONTAINER
CO	6	EA	CELTIS OCCIDENTALIS 'PRAIRIE PRIDE'	PRAIRIE PRIDE HACKBERRY	2" CAL. B&B
GT	15	EA	GLEDITSIA TRIACANTHOS INERMIS 'DRAVES'	STREET KEEPER®HONEY LOCUST	2" CAL. B&B
GD	11	EA	GYMNOCLADUS DIOICUS 'ESPRESSO'	KENTUCKY COFFEETREE	2" CAL. B&B
PA	6	EA	PLATANUS X ACERIFOLIA 'MORTON CIRCLE'	EXCLAMATION™ LONDON PLANE TREE	2" CAL. B&B
QB	2	EA	QUERCUS BICOLOR 'AMERICAN DREAM'	AMERICAN DREAM SWAMP WHITE OAK	2" CAL. B&B
QJ	4	EA	QUERCUS X BIMUNDORUM 'JFS-KW1QX'	STREETSPIRE® OAK	2" CAL. B&B
UP	10	EA	ULMUS AMERICANA 'PRINCETON'	PRINCETON AMERICAN ELM	2" CAL. B&B
SHRUBS	QTY	UNIT	BOTANICAL NAME	COMMON NAME	CONTAINER
HP	21	EA	HYDRANGEA PANICULATA 'ILVOBO'	BOBO HYDRANGEA	#5 CONT.
ORNAMENTAL GRASSES	QTY	UNIT	BOTANICAL NAME	COMMON NAME	CONTAINER
BG	328	EA	BOUTELOUA GRACILIS	BLUE GRAMA GRASS	#1 CONT.
PS	7	EA	PANICUM VIRGATUM 'SHENANDOAH'	SHENANDOAH SWITCH GRASS	#1 CONT.
SS	164	EA	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'	STANDING OVATION LITTLE BLUESTEM	#1 CONT.
SH	217	EA	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	#1 CONT.
PERENNIALS	QTY	UNIT	BOTANICAL NAME	COMMON NAME	CONTAINER
AP	112	EA	ALLIUM X 'PURPLE SENSATION'	PURPLE SENSATION ORNAMENTAL ONION	#1 CONT.
AC	6	EA	ASTILBE CHINENSIS 'DARK SIDE OF THE MOON'	DARK SIDE OF THE MOON ASTILBE	#1 CONT.
DG	475	EA	DIANTHUS GRATIANOPOLITANUS 'FIREWITCH'	FIREWITCH CHEDDAR PINK	#1 CONT.
EP	246	EA	ECHINACEA PURPUREA 'LITTLE GIANT'	LITTLE GIANT CONEFLOWER	#1 CONT.
HS	158	EA	HYLOTELEPHIUM SPECTABILE 'AUTUMN FIRE'	AUTUMN FIRE STONECROP	#1 CONT.
PD	290	EA	PENSTEMON DIGITALIS 'HUSKER RED'	HUSKER RED BEARDTONGUE	#1 CONT.
RF	268	EA	RUDBECKIA FULGIDA SULLIVANTII 'GOLDSTURM'	GOLDSTURM CONEFLOWER	#1 CONT.
VW	245	EA	VERONICA X 'WIZARD OF AHHS'	MAGIC SHOW® BLUE SPEEDWELL	#1 CONT.

GENERAL LANDSCAPE IMPROVEMENT NOTES:

1. MASTER PLANT SCHEDULE: TREES, SHRUBS AND PERENNIALS ARE LISTED IN THE MASTER PLANT SCHEDULE. IF THERE IS A CONFLICT BETWEEN THE QUANTITIES SHOWN ON THE DRAWING AND THE QUANTITIES SHOWN IN THE PLANT SCHEDULE, THE PLAN QUANTITIES SHALL PREVAIL.
2. PLANTING LAYOUT: LAYOUT A TYPICAL SHRUB AND PERENNIAL BED LAYOUT, AND OBTAIN APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO PLANTING.
3. SHRUB AND PERENNIAL GROUPINGS SHALL BE PLANTED AND MULCHED IN ONE CONTINUOUSLY MULCHED BED.
4. SOD AREAS WHERE INDICATED ON R-SERIES EROSION CONTROL PLANS.
5. AMENDED PLANTING SOIL MIX TO CONSIST OF 60% TOPSOIL, 30% SAND, AND 10% COMPOST. CONTRACTOR SHALL INSTALL IN TWO LIFTS AND PRE-SETTLE THE SOIL TO REQUIRED DEPTH PRIOR TO PLANTING.
6. RUBBER MULCH PRODUCT TO BE XYLEM LTD, COLOR: REDWOOD, OR APPROVED EQUAL.



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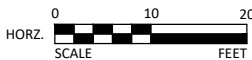
MAIN STREET RECONSTRUCTION

STREETSCAPE AND LANDSCAPE NOTES

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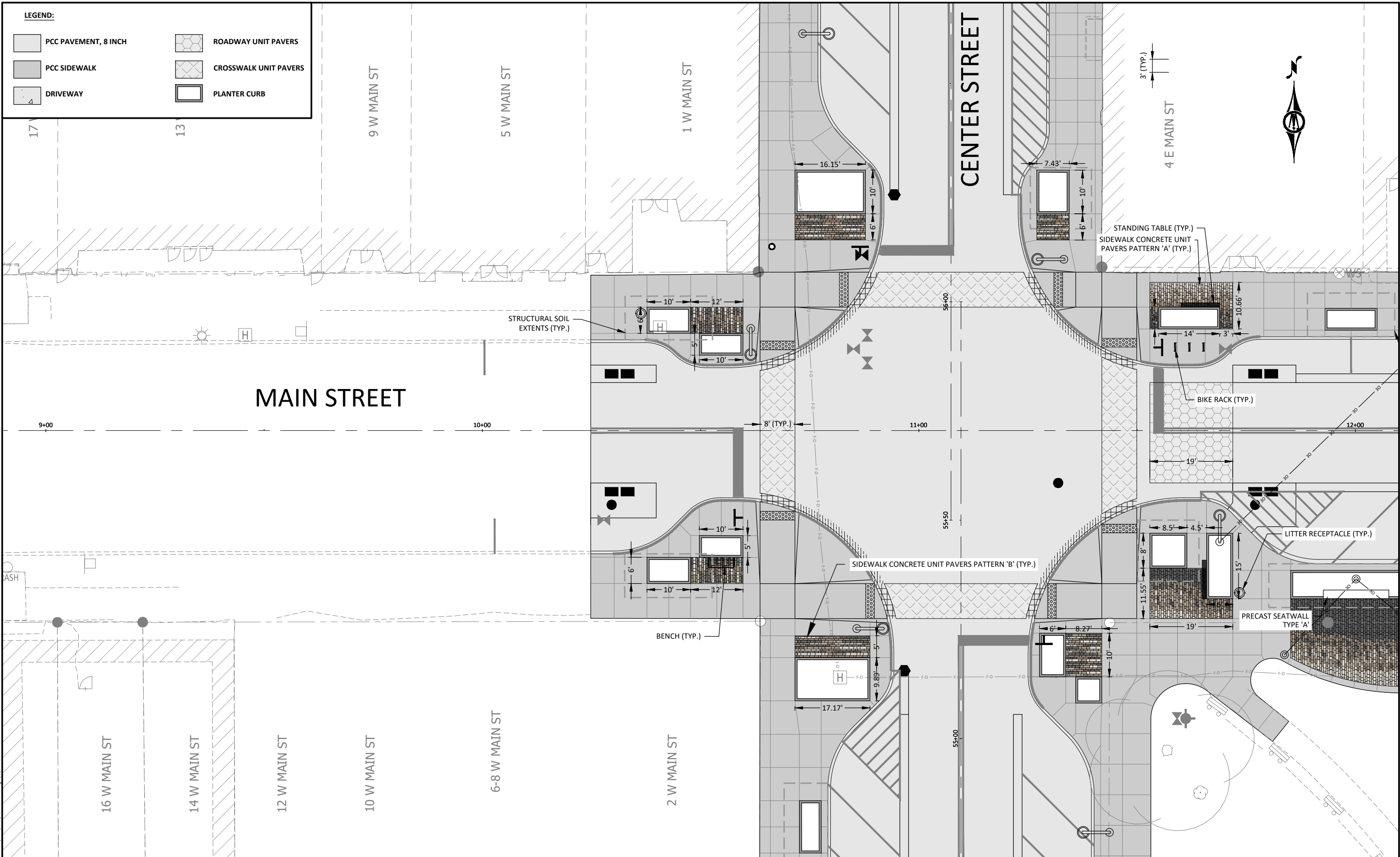
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

STREETSCAPE PLAN

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LEGEND:

PCC PAVEMENT, 8 INCH

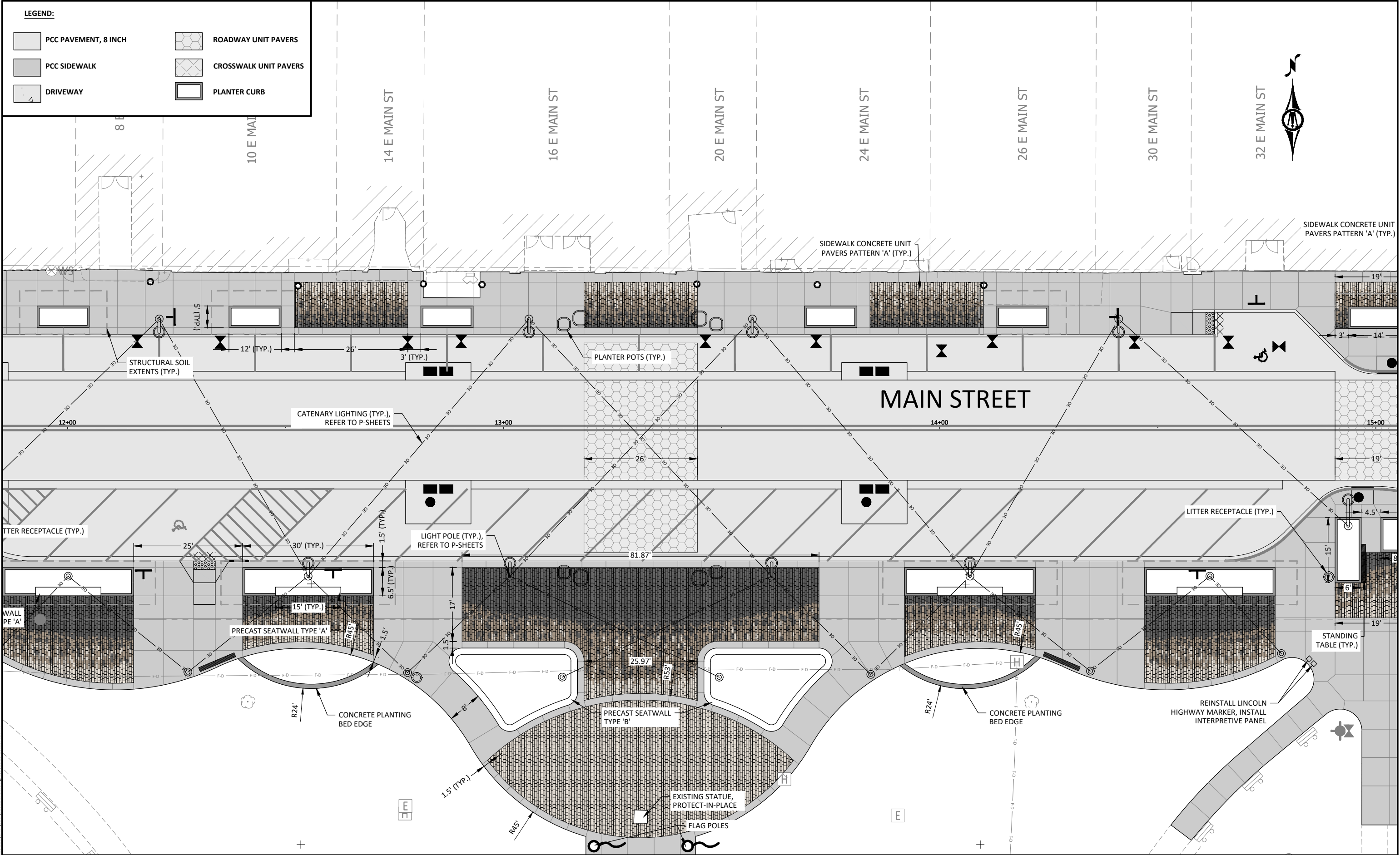
PCC SIDEWALK

DRIVEWAY

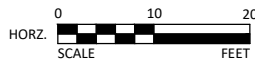
ROADWAY UNIT PAVERS

CROSSWALK UNIT PAVERS

PLANTER CURB



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STREETScape PLAN

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K.02

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PCC PAVEMENT, 8 INCH

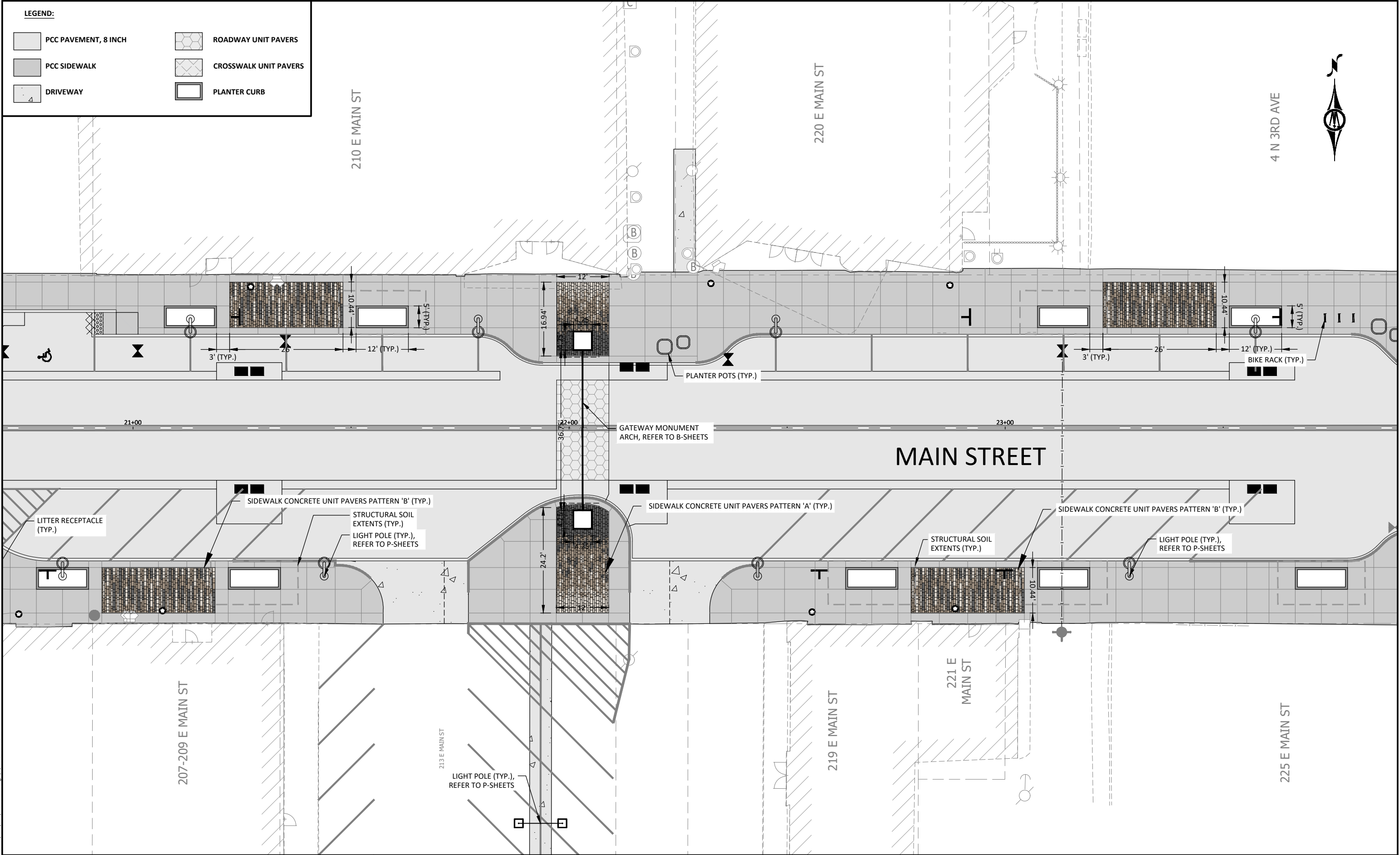
PCC SIDEWALK

DRIVEWAY

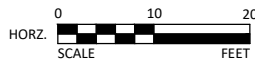
ROADWAY UNIT PAVERS

CROSSWALK UNIT PAVERS

PLANTER CURB



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STREETSCAPE PLAN

SHEET
K.05

This site plan illustrates the proposed improvements for the intersection of Main Street and 3rd Avenue. The plan shows the layout of the streets, including Main Street, 3rd Avenue, and the intersecting streets (219 E Main St, 221 E Main St, 225 E Main St, and 4 N 3rd). Key features include the proposed bike rack, planter pots, and the sidewalk concrete unit pavers pattern 'B'. The plan also shows the structural soil extents and the light pole location. The stationing for Main Street is indicated as 23+00, 24+00, and 25+00. The plan includes a north arrow and a scale bar.

Proposed Improvements:

- Bike Rack (TYP.)
- Planter Pots (TYP.)
- Sidewalk Concrete Unit Pavers Pattern 'B' (TYP.)
- Structural Soil Extents (TYP.)
- Light Pole (TYP.), Refer to P-Sheets

Street Layout:

- Main Street (Stationing: 23+00, 24+00, 25+00)
- 3rd Avenue
- 219 E Main St
- 221 E Main St
- 225 E Main St
- 4 N 3rd

Other Features:

- Stationing: 23+00, 24+00, 25+00
- North Arrow
- Scale Bar



DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
DEM			
CHECKED			
GAB			
CLIENT PROJ. NO. DA1.129221			

SHEET

K.06

LEGEND:

PCC PAVEMENT, 8 INCH

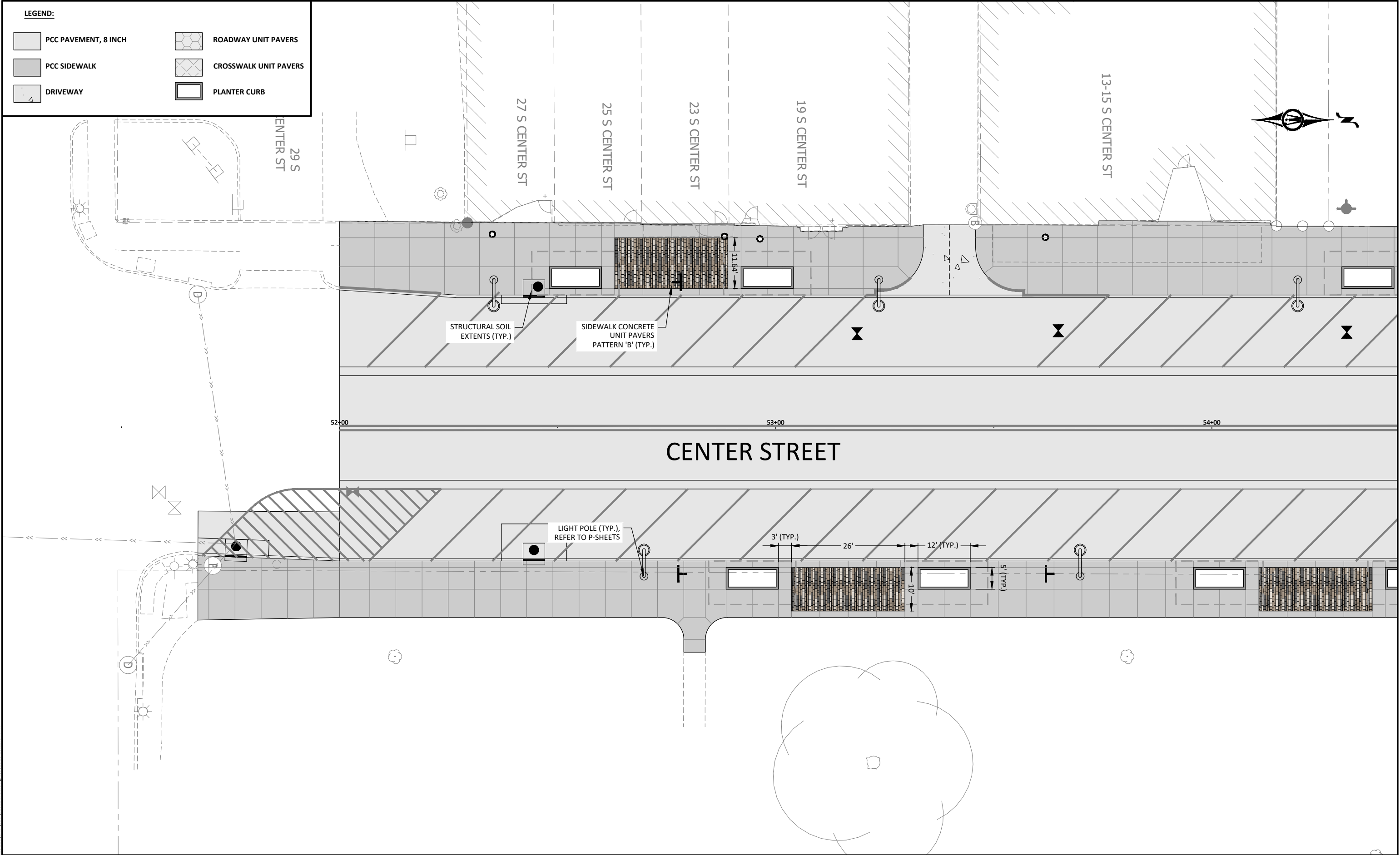
PCC SIDEWALK

DRIVEWAY

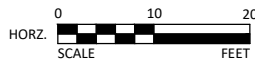
ROADWAY UNIT PAVERS

CROSSWALK UNIT PAVERS

PLANTER CURB



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DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN	DEM		
CHECKED	GAB		
CLIENT PROJ. NO.	0A1.129221		

CITY OF MARSHALLTOWN, IOWA
 MAIN STREET RECONSTRUCTION
 STREETScape PLAN

SHEET

K.07

LEGEND:

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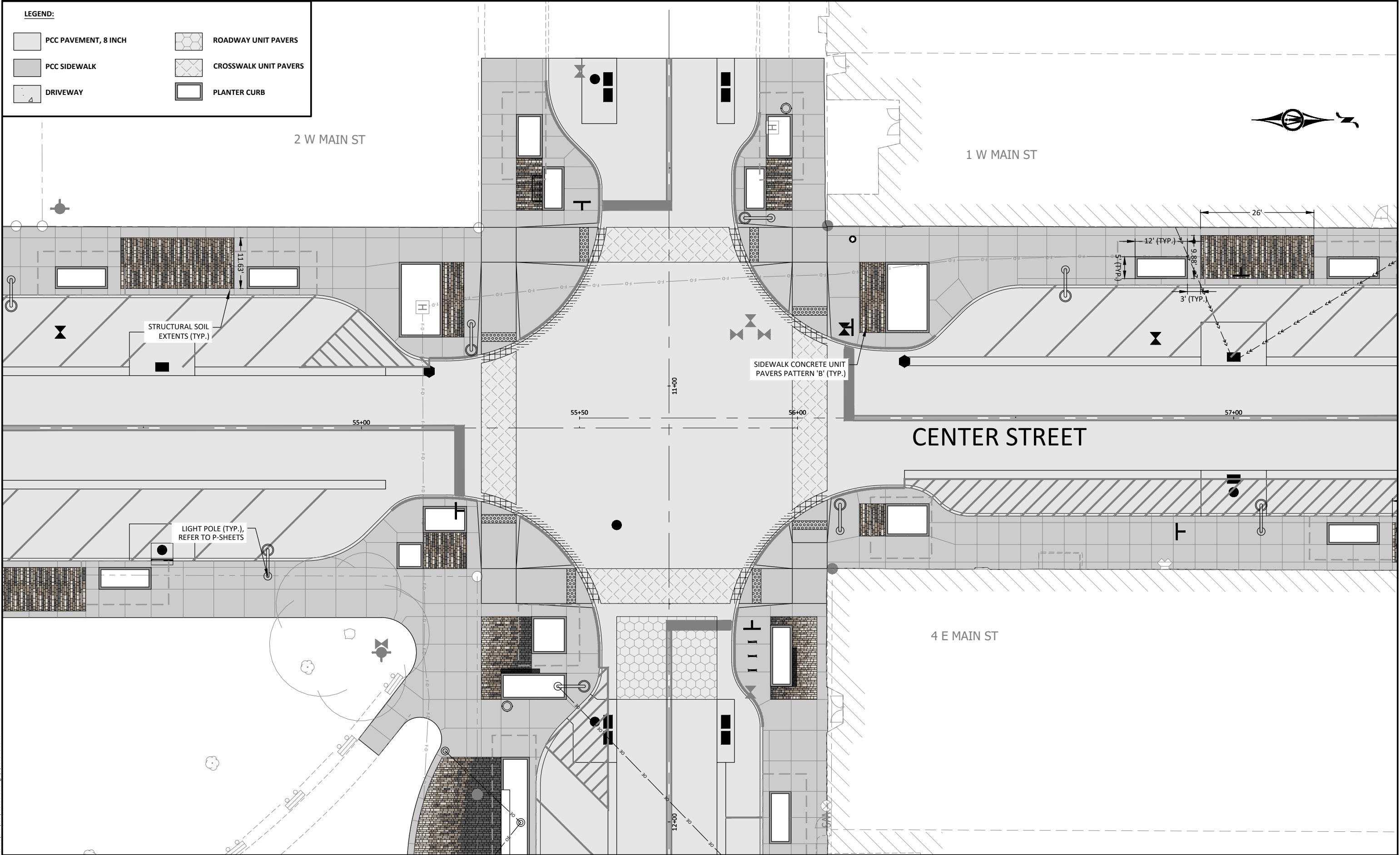
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DRIVEWAY

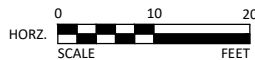
ROADWAY UNIT PAVERS

CROSSWALK UNIT PAVERS

PLANTER CURB



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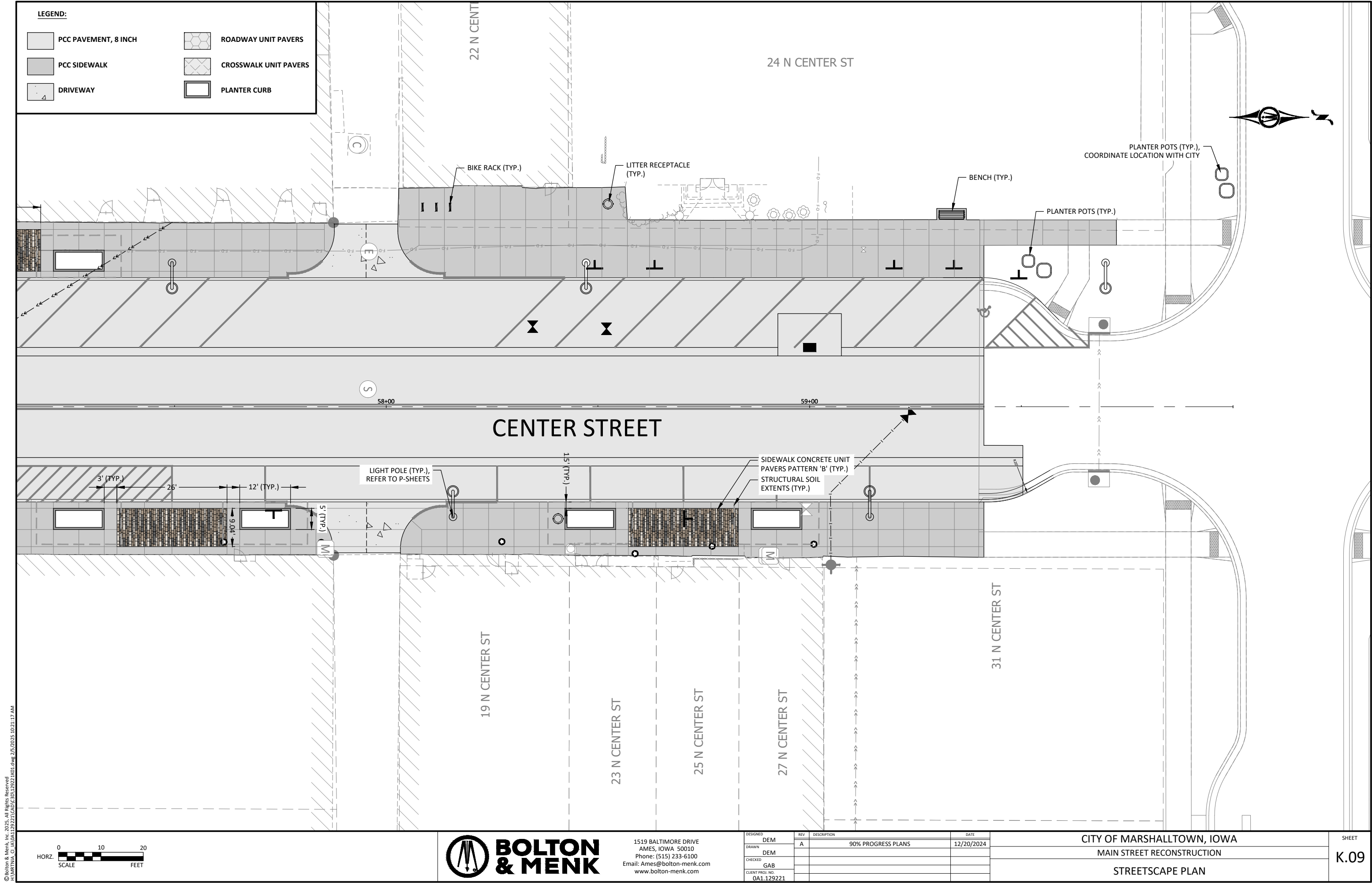


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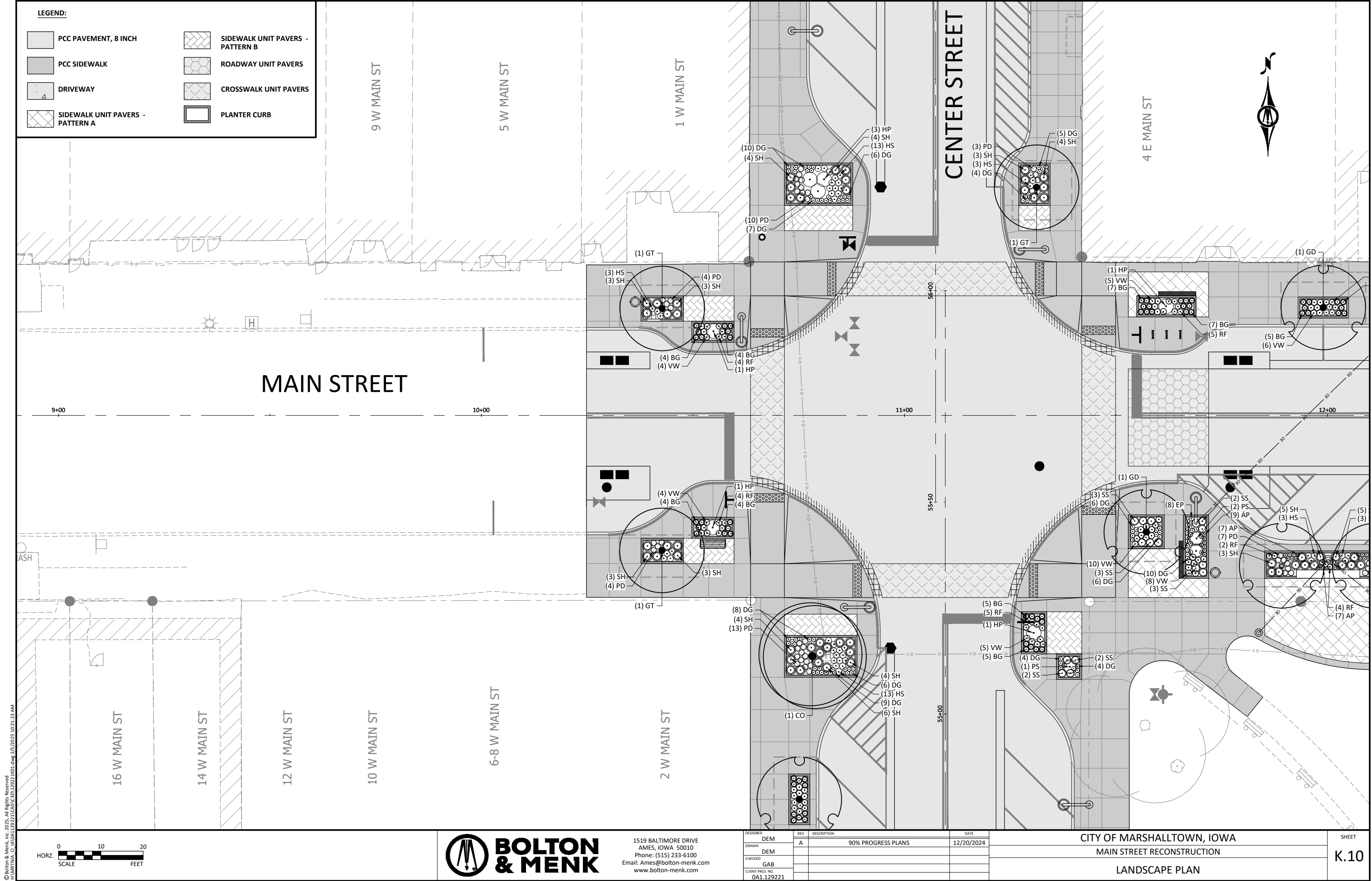
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
STREETSCAPE PLAN

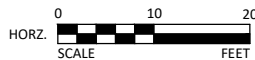
SHEET
K.08



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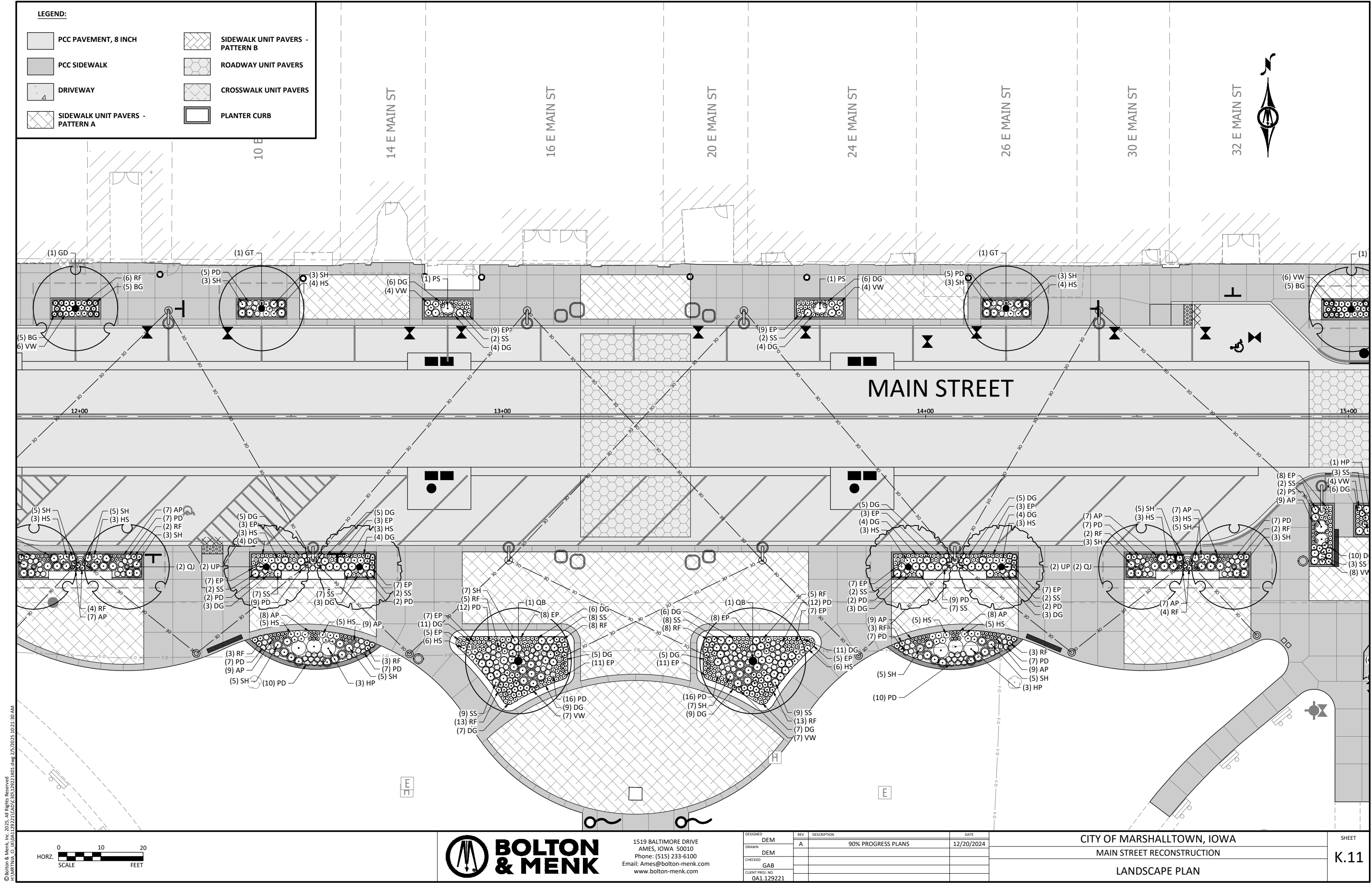


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DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN	DEM		
CHECKED	GAB		
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
LANDSCAPE PLAN

SHEET
K.10



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LEGEND:

- PCC PAVEMENT, 8 INCH
- PCC SIDEWALK
- DRIVEWAY
- SIDEWALK UNIT PAVERS - PATTERN A
- SIDEWALK UNIT PAVERS - PATTERN B
- ROADWAY UNIT PAVERS
- CROSSWALK UNIT PAVERS
- PLANTER CURB

1ST AVENUE

11 N 1ST AVE

110 E MAIN ST

118 E MAIN ST

120 E MAIN ST

MAIN STREET

109 E MAIN ST

101 E MAIN ST

0 10 20
HORIZ. SCALE FEET

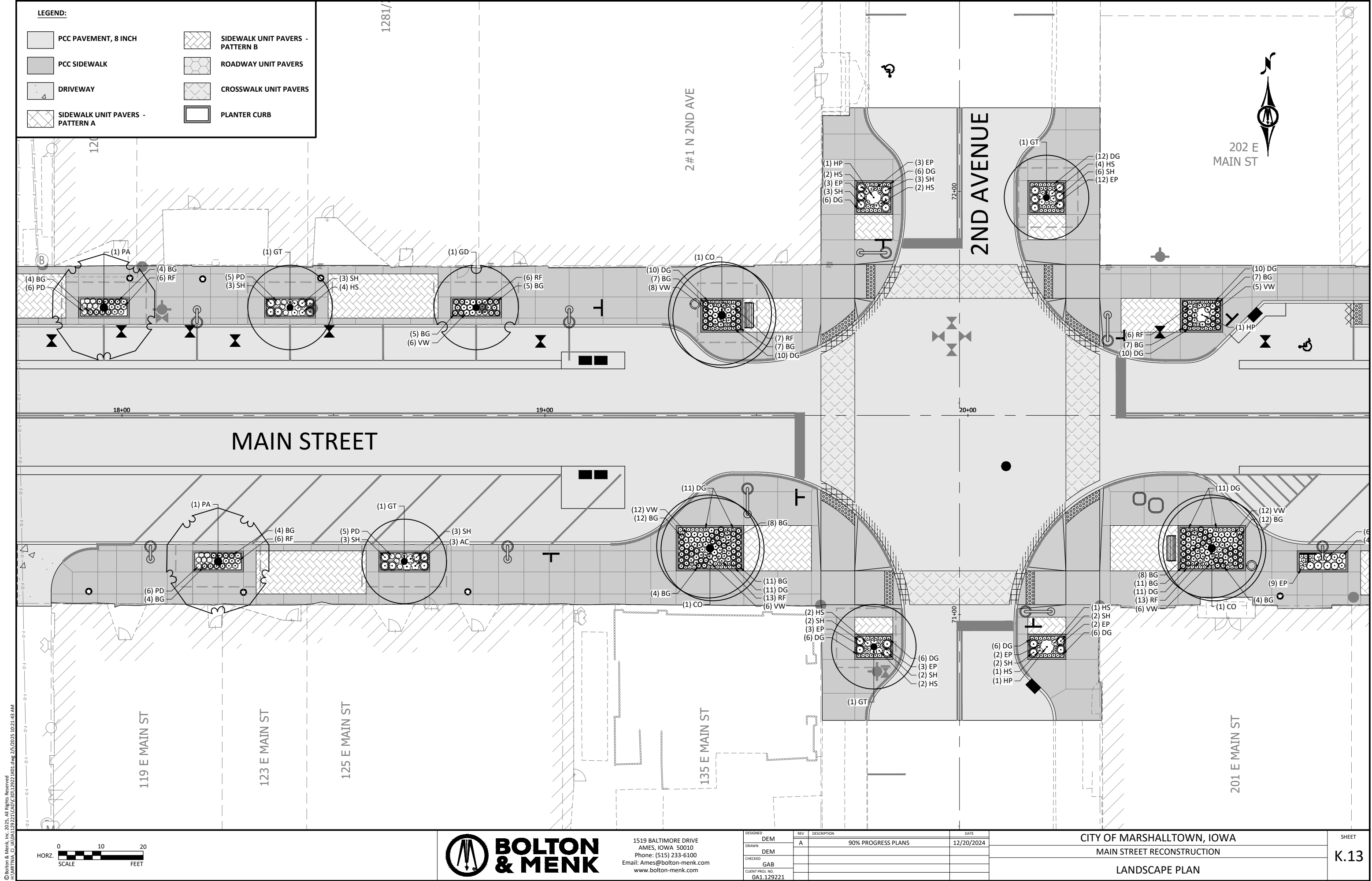
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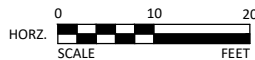
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DRAWN			
CHECKED			
CLIENT PROJ. NO.			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
LANDSCAPE PLAN

SHEET
K.12



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119 E MAIN ST
123 E MAIN ST
125 E MAIN ST
135 E MAIN ST
201 E MAIN ST
1281/



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DEM	A	90% PROGRESS PLANS	12/20/2024
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0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
LANDSCAPE PLAN

SHEET
K.13

LEGEND:

PCC PAVEMENT, 8 INCH

PCC SIDEWALK

DRIVEWAY

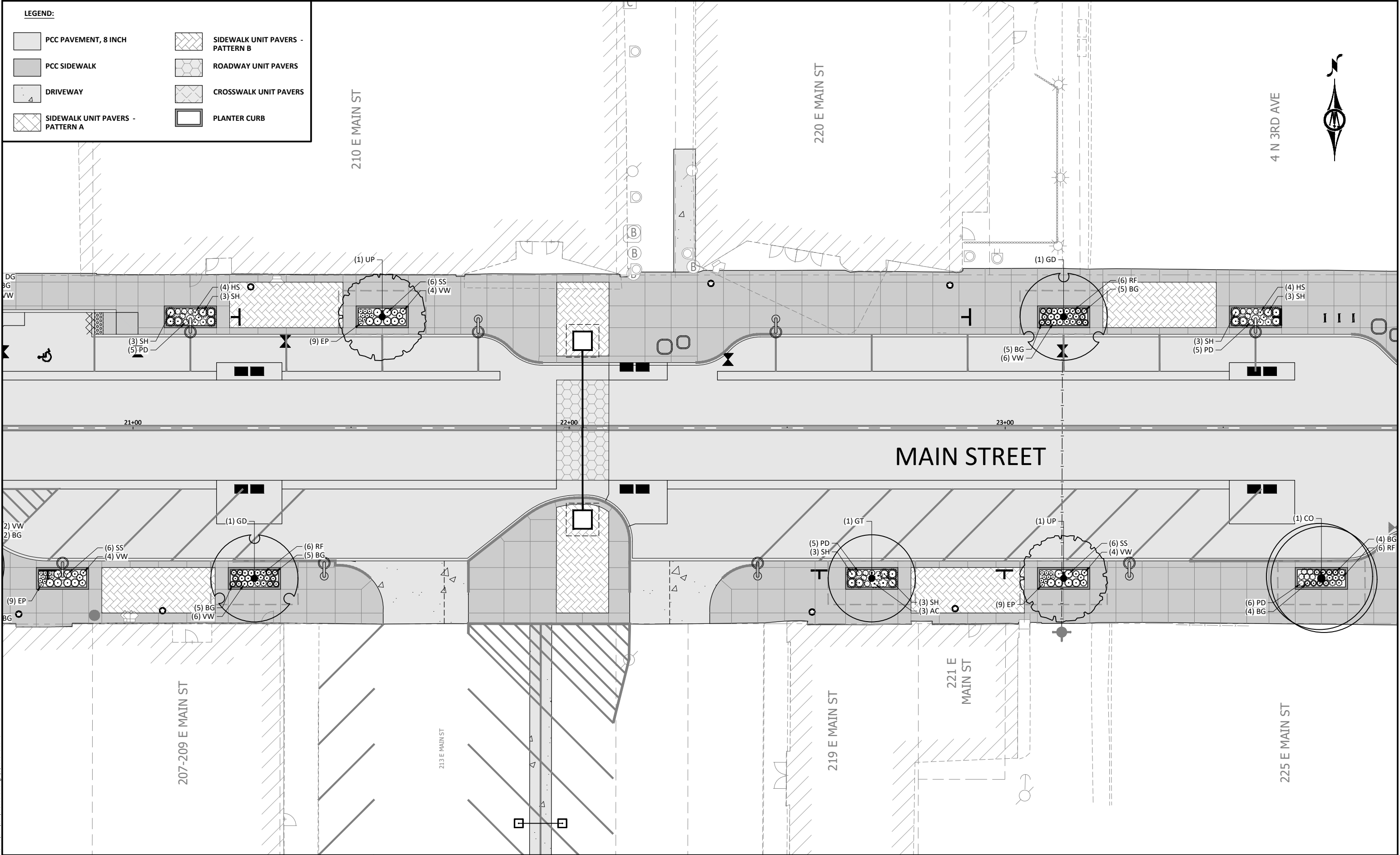
SIDEWALK UNIT PAVERS - PATTERN A

SIDEWALK UNIT PAVERS - PATTERN B

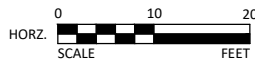
ROADWAY UNIT PAVERS

CROSSWALK UNIT PAVERS

PLANTER CURB



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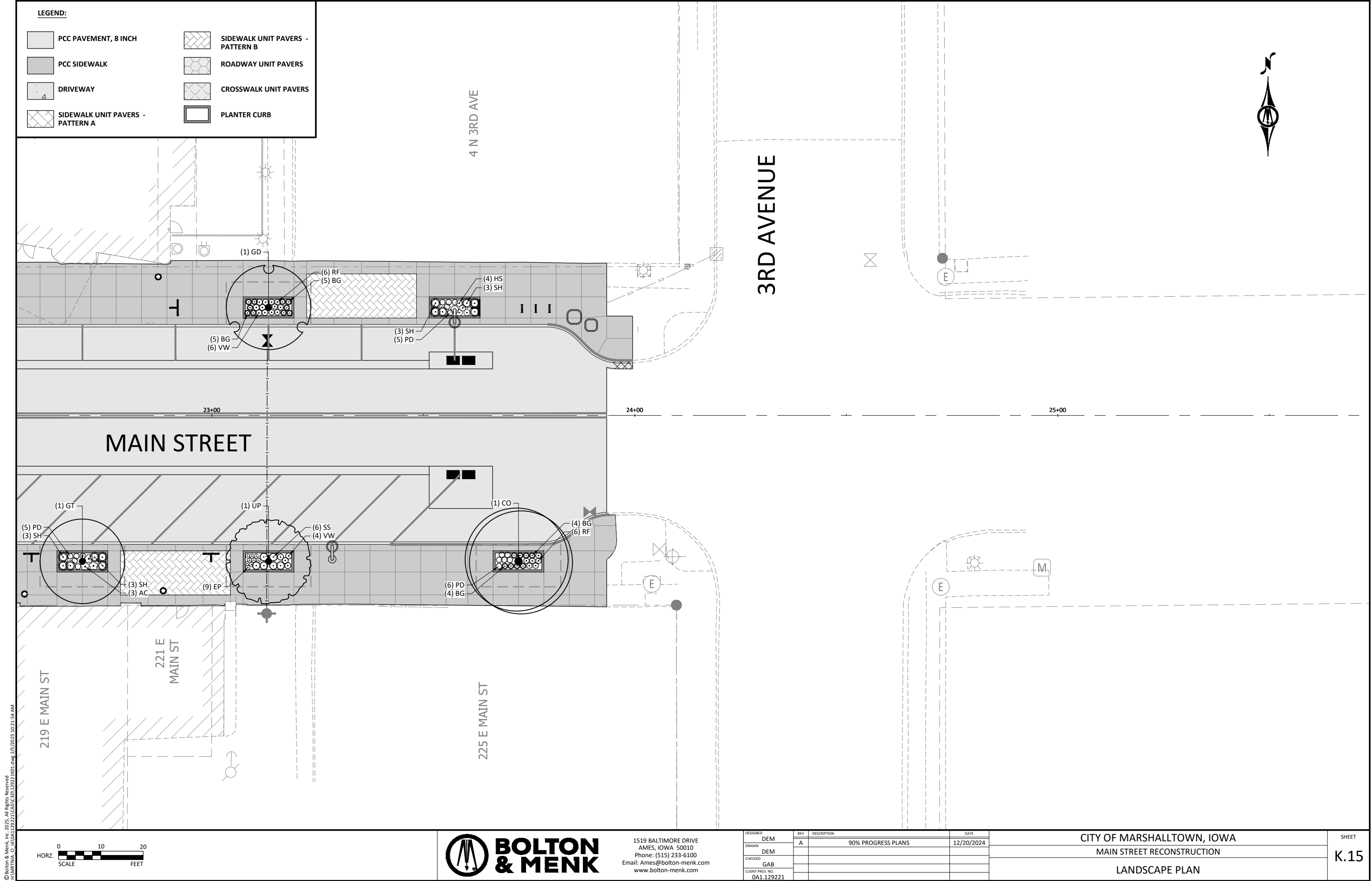


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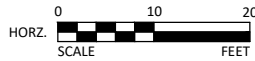
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DRAWN	DEM		
CHECKED	GAB		
CLIENT PROJ. NO.	0A1.129221		

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
LANDSCAPE PLAN

SHEET
K.14



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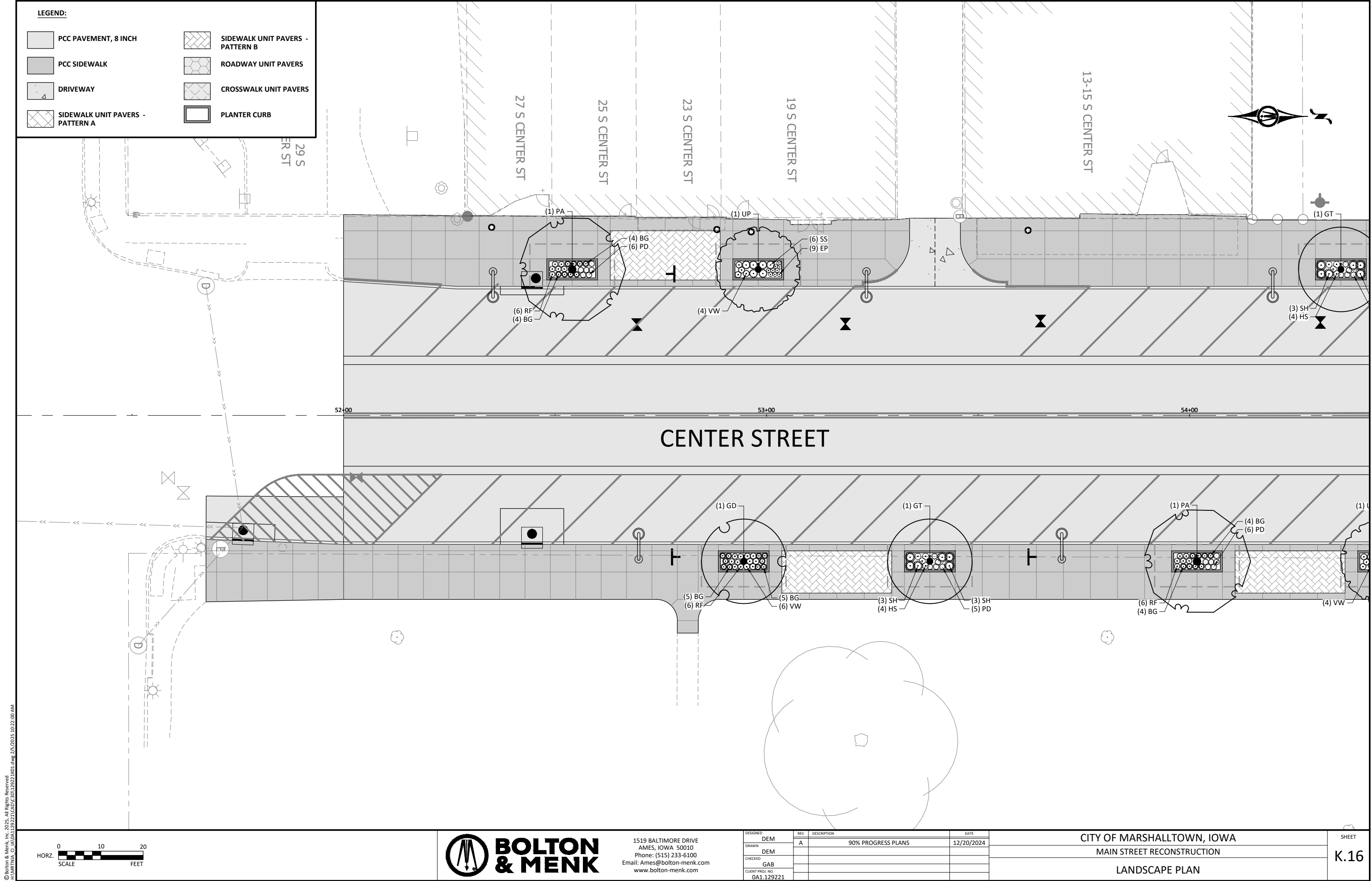


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DEM	A	90% PROGRESS PLANS	12/20/2024
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
LANDSCAPE PLAN

SHEET
K.15



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LEGEND:

PCC PAVEMENT, 8 INCH

PCC SIDEWALK

DRIVEWAY

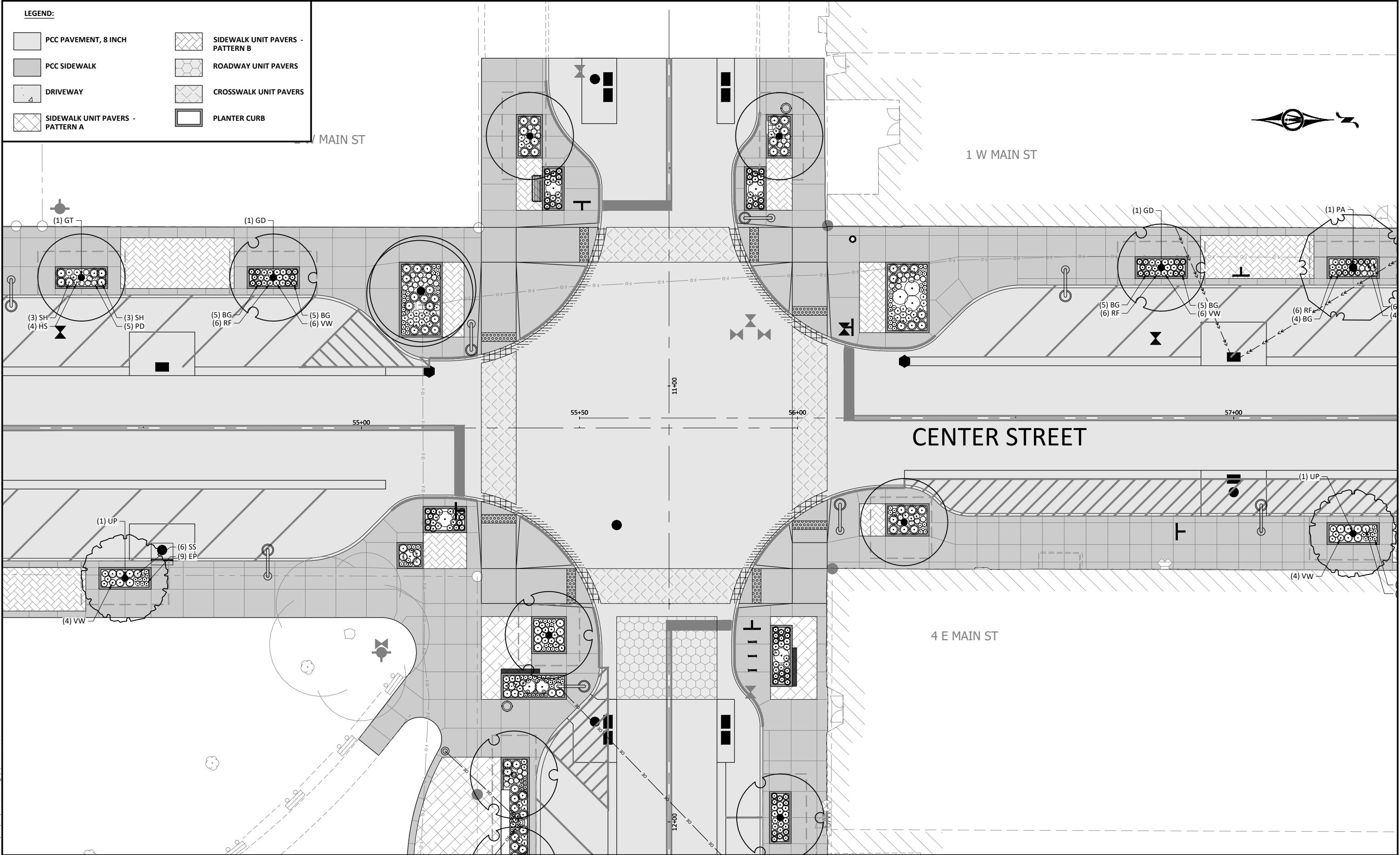
SIDEWALK UNIT PAVERS -
PATTERN A

SIDEWALK UNIT PAVERS -
PATTERN B

ROADWAY UNIT PAVERS

CROSSWALK UNIT PAVERS

PLANTER CURB



0

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20

HORZ.

SCALE

FEET

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DRAWN	DEM	A	90% PROGRESS PLANS	12/20/2024
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CLIENT PROJ. NO.	0A1.129221			

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

LANDSCAPE PLAN

SHEET

K.17

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LEGEND:

PCC PAVEMENT, 8 INCH

PCC SIDEWALK

DRIVEWAY

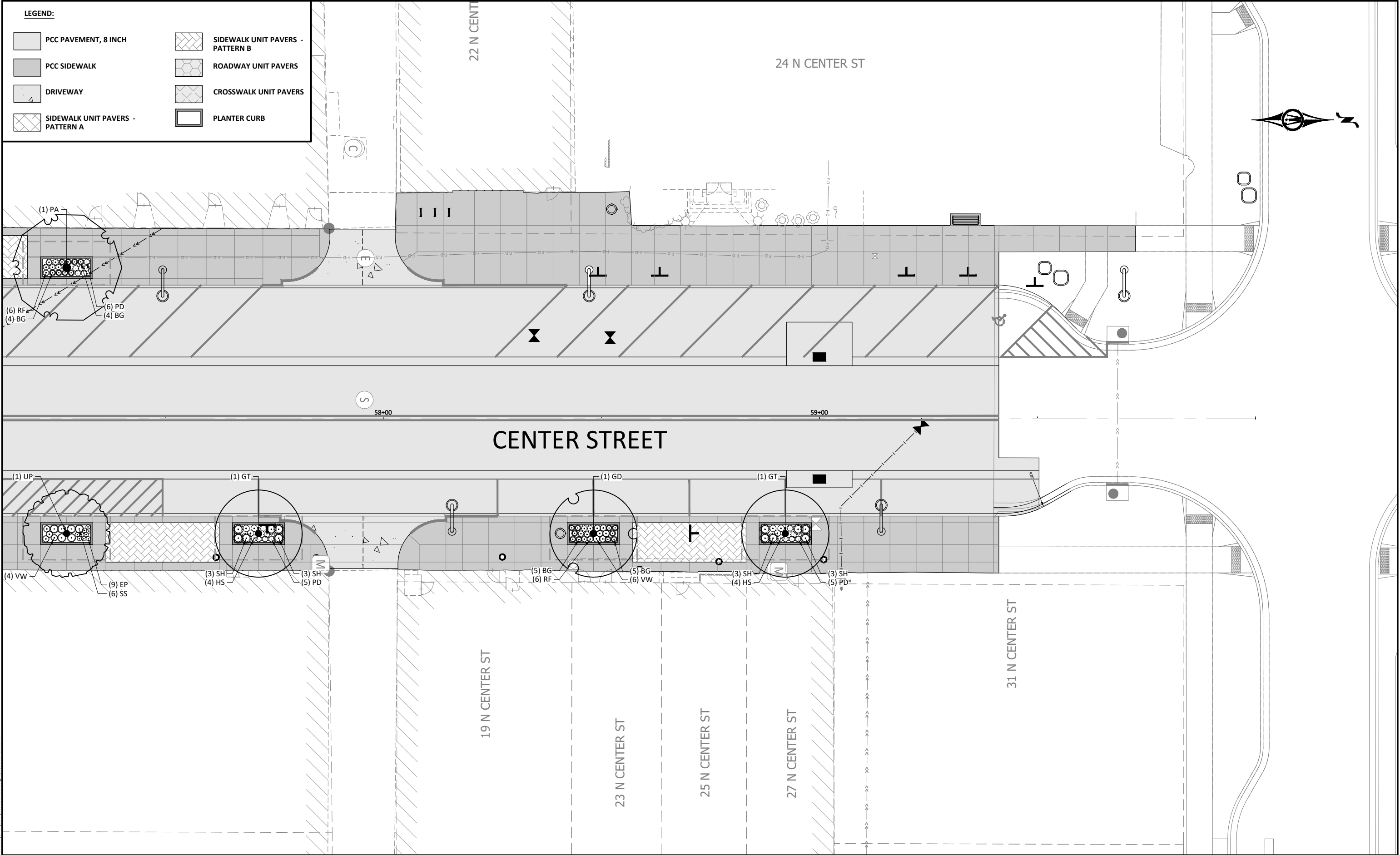
SIDEWALK UNIT PAVERS - PATTERN A

SIDEWALK UNIT PAVERS - PATTERN B

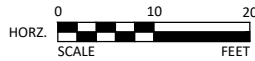
ROADWAY UNIT PAVERS

CROSSWALK UNIT PAVERS

PLANTER CURB



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DEM			
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GAB			
CLIENT PROJ. NO.			
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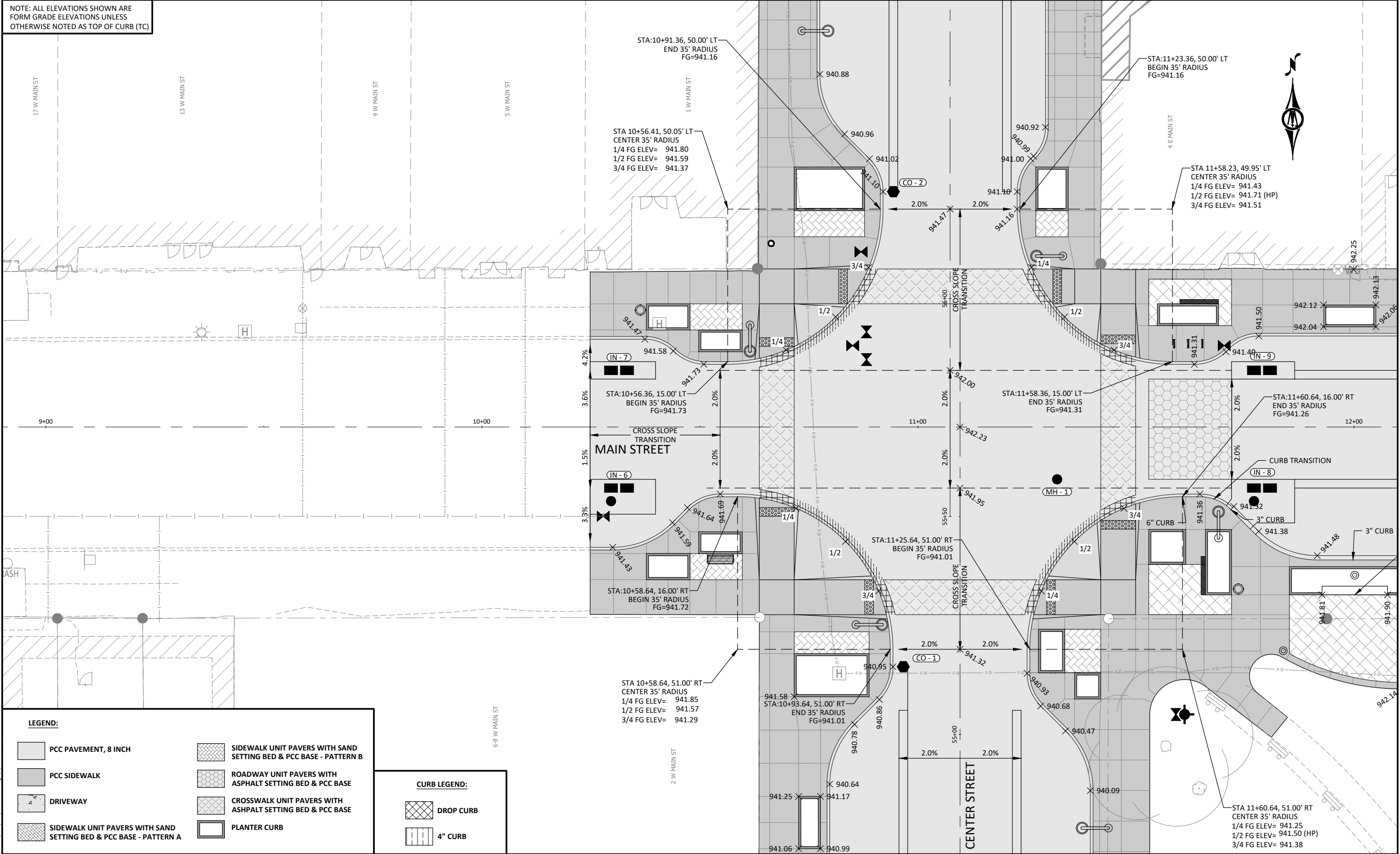
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

LANDSCAPE PLAN

SHEET

K.18

NOTE: ALL ELEVATIONS SHOWN ARE
FORM GRADE ELEVATIONS UNLESS
OTHERWISE NOTED AS TOP OF CURB (TC)



LEGEND:

- PCC PAVEMENT, 8 INCH
- PCC SIDEWALK
- DRIVEWAY
- SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN A

- SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN B
- ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE
- CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE
- PLANTER CURB

CURB LEGEND:

- DROP CURB
- 4" CURB



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DEM	A	90% PROGRESS PLANS	12/20/2024
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CLIENT PROJ. NO.			
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CITY OF MARSHALLTOWN, IOWA

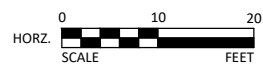
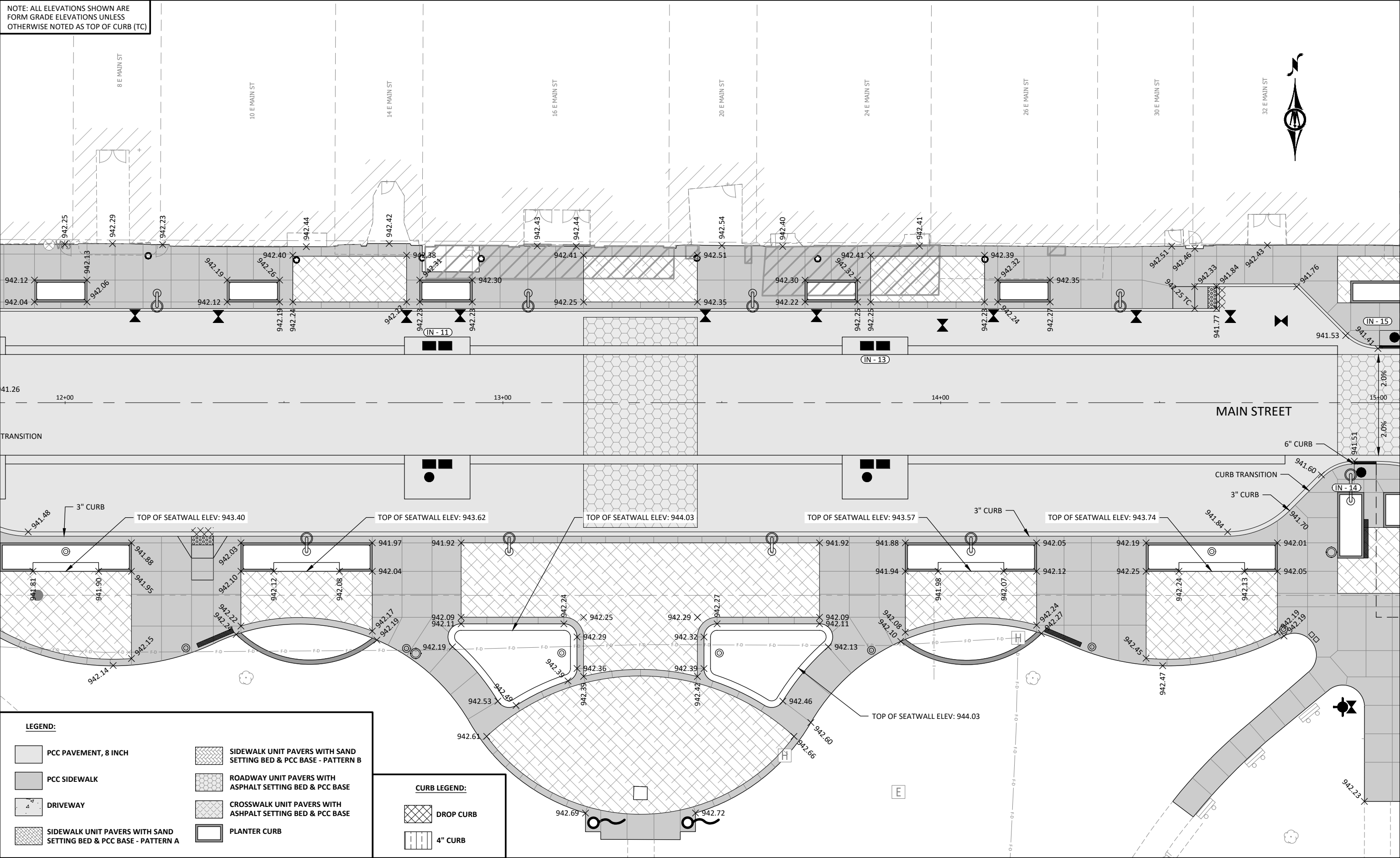
MAIN STREET RECONSTRUCTION

INTERSECTION DETAILS

SHEET

L1.01

NOTE: ALL ELEVATIONS SHOWN ARE
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OTHERWISE NOTED AS TOP OF CURB (TC)



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DRAWN DEM	A	90% PROGRESS PLANS	12/20/2024
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CLIENT PROJ. NO. 0A1.129221			

CITY OF MARSHALLTOWN, IOWA

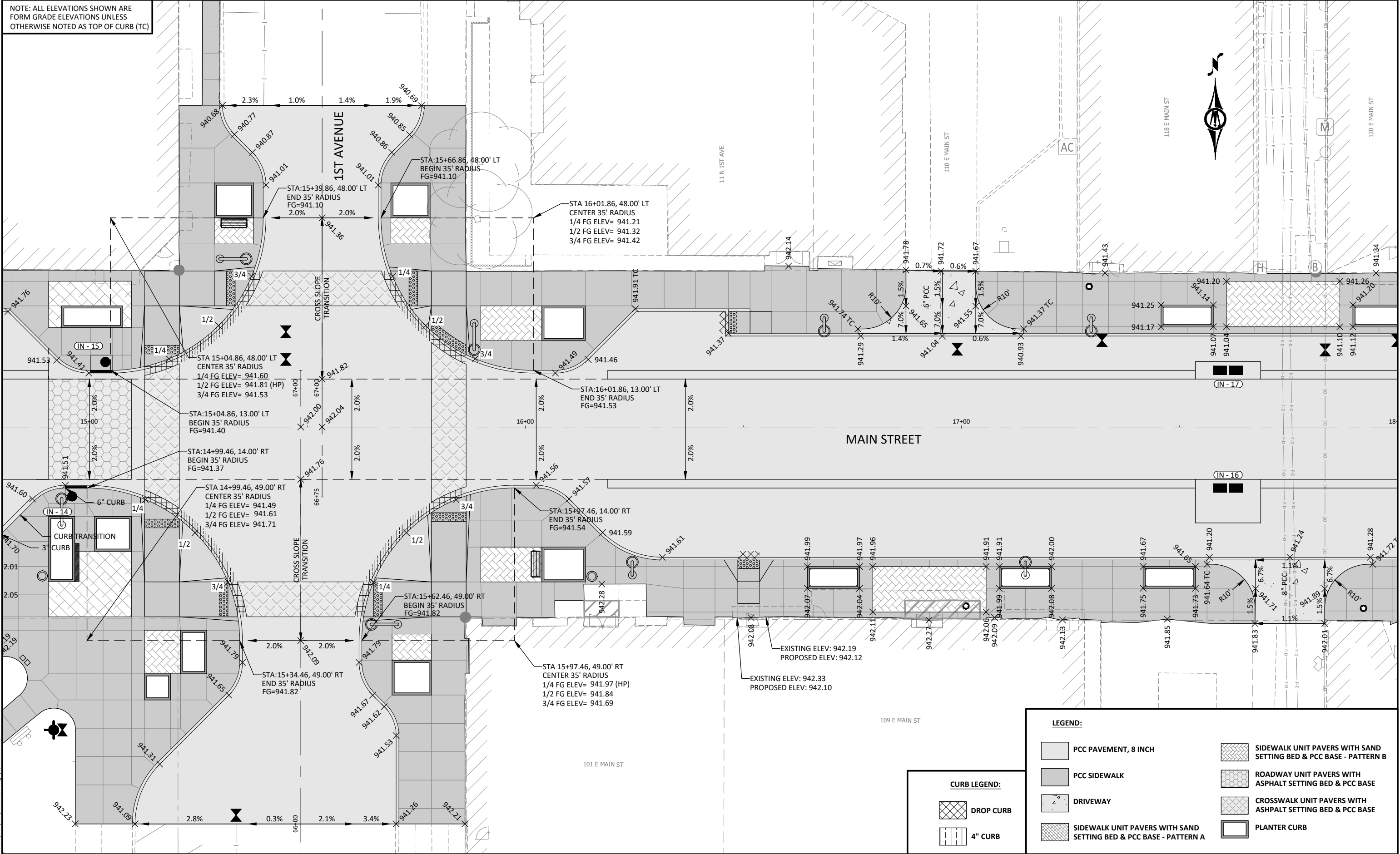
MAIN STREET RECONSTRUCTION

INTERSECTION DETAILS

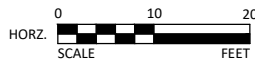
SHEET

1.02

NOTE: ALL ELEVATIONS SHOWN ARE
FORM GRADE ELEVATIONS UNLESS
OTHERWISE NOTED AS TOP OF CURB (TC)



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DEM	A	90% PROGRESS PLANS	12/20/2024
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CLIENT PROJ. NO.			
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CITY OF MARSHALLTOWN, IOWA

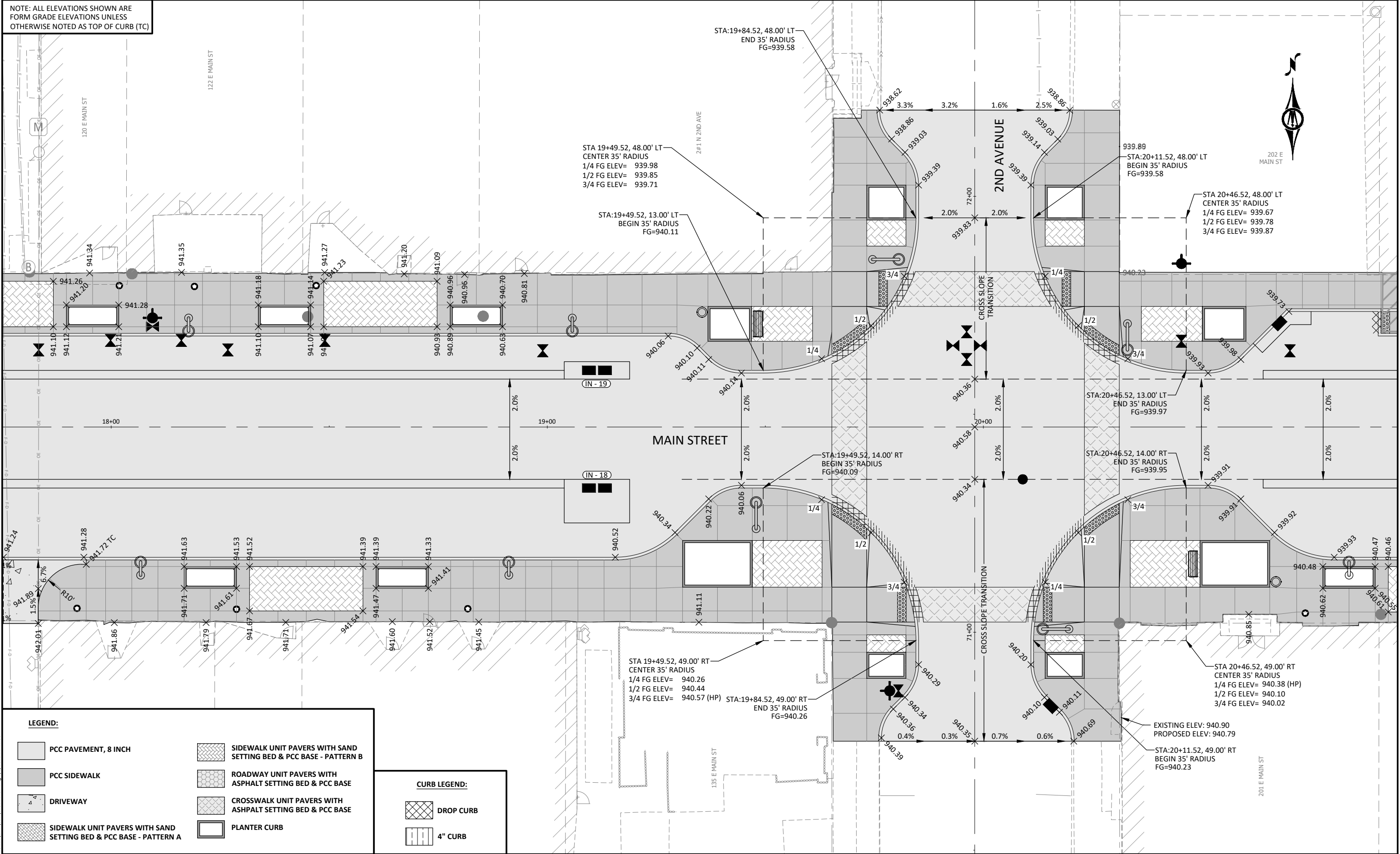
MAIN STREET RECONSTRUCTION

INTERSECTION DETAILS

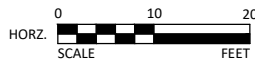
SHEET

L1.03

NOTE: ALL ELEVATIONS SHOWN ARE
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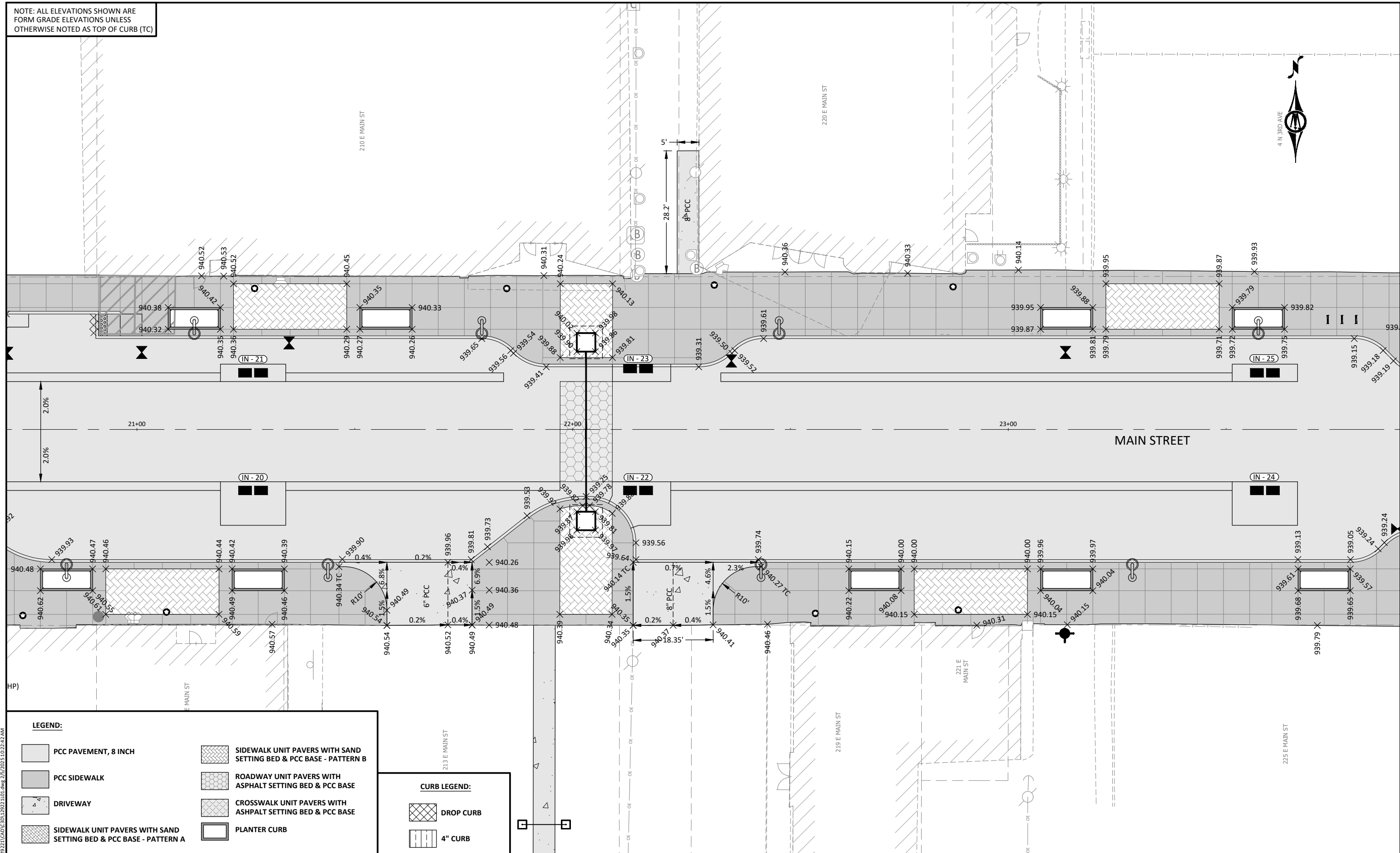
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
INTERSECTION DETAILS

SHEET
L1.04

NOTE: ALL ELEVATIONS SHOWN ARE
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OTHERWISE NOTED AS TOP OF CURB (TC)

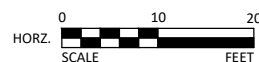


LEGEND:

- | | | | |
|---|---|---|---|
|  | PCC PAVEMENT, 8 INCH |  | SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN B |
|  | PCC SIDEWALK |  | ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE |
|  | DRIVEWAY |  | CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE |
|  | SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN A |  | PLANTER CURB |

CURB LEGEND:

-  **DROP CURB**
-  **4" CURB**



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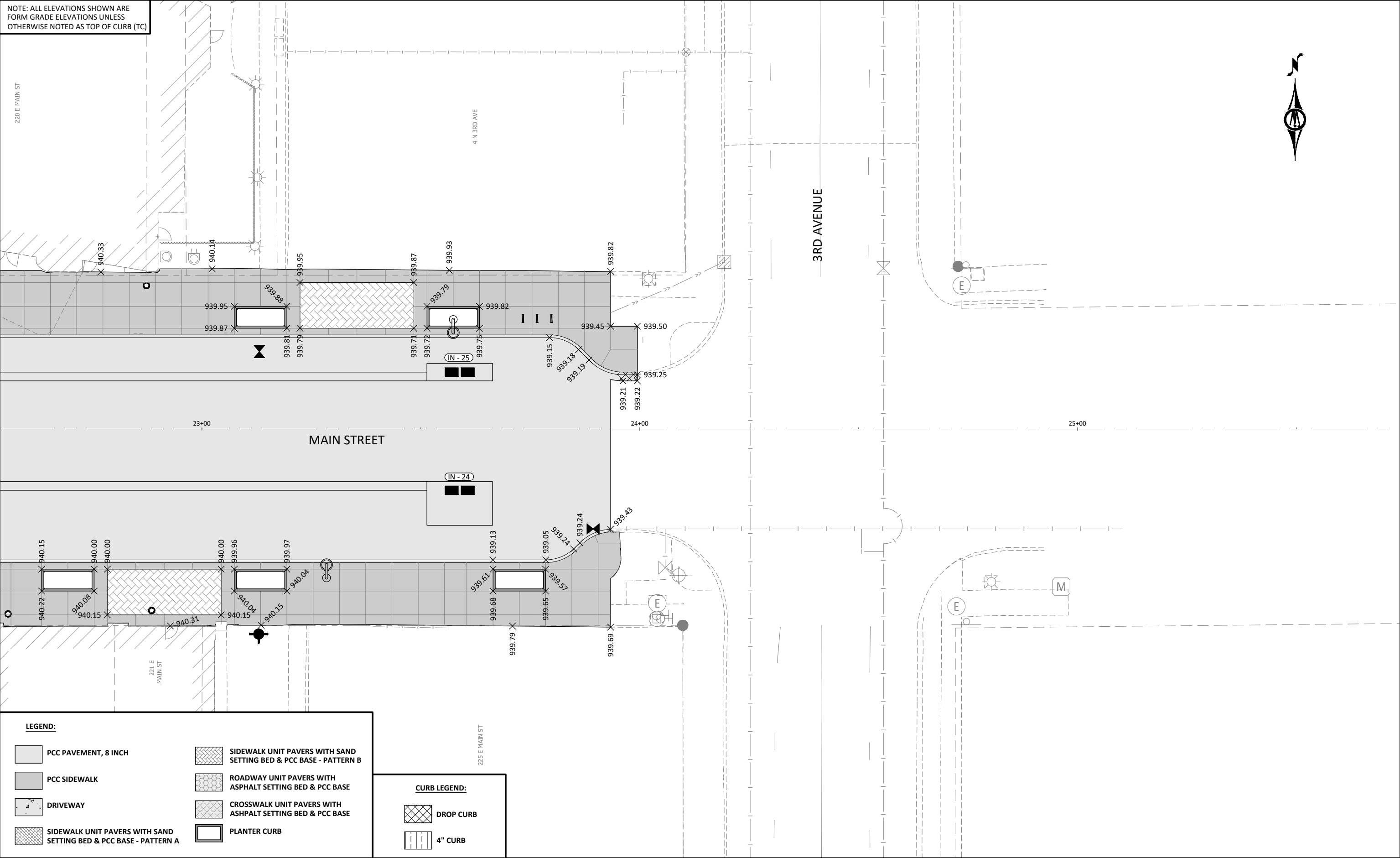
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CLIENT PROJ. NO. 0A1.129221			

CITY OF MARSHALLTOWN, IOWA MAIN STREET RECONSTRUCTION INTERSECTION DETAILS

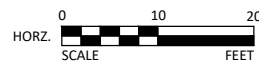
SHEET

1.05 |

NOTE: ALL ELEVATIONS SHOWN ARE
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CLIENT PROJ. NO. 0A1.129221			

CITY OF MARSHALLTOWN, IOWA

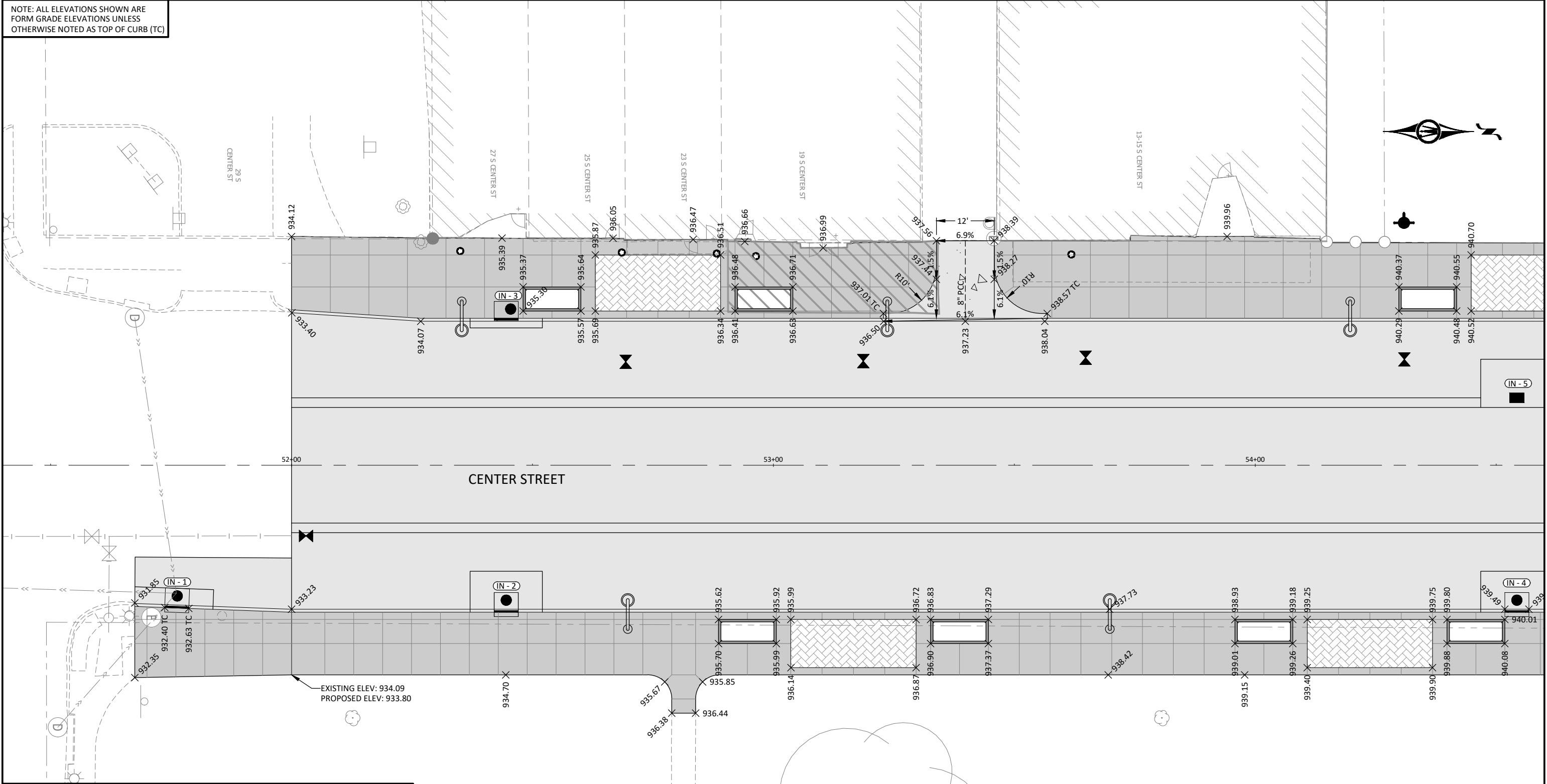
MAIN STREET RECONSTRUCTION

INTERSECTION DETAILS

SHEET

1.06 |

NOTE: ALL ELEVATIONS SHOWN ARE
FORM GRADE ELEVATIONS UNLESS
OTHERWISE NOTED AS TOP OF CURB (TC)



LEGEND:

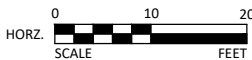
- PCC PAVEMENT, 8 INCH
- PCC SIDEWALK
- DRIVEWAY
- SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN A

- SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN B
- ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE
- CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE

CURB LEGEND:

- DROP CURB
- 4" CURB

- PLANTER CURB



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DESIGNED	REV	DESCRIPTION	DATE
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CLIENT PROJ. NO.			
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CITY OF MARSHALLTOWN, IOWA

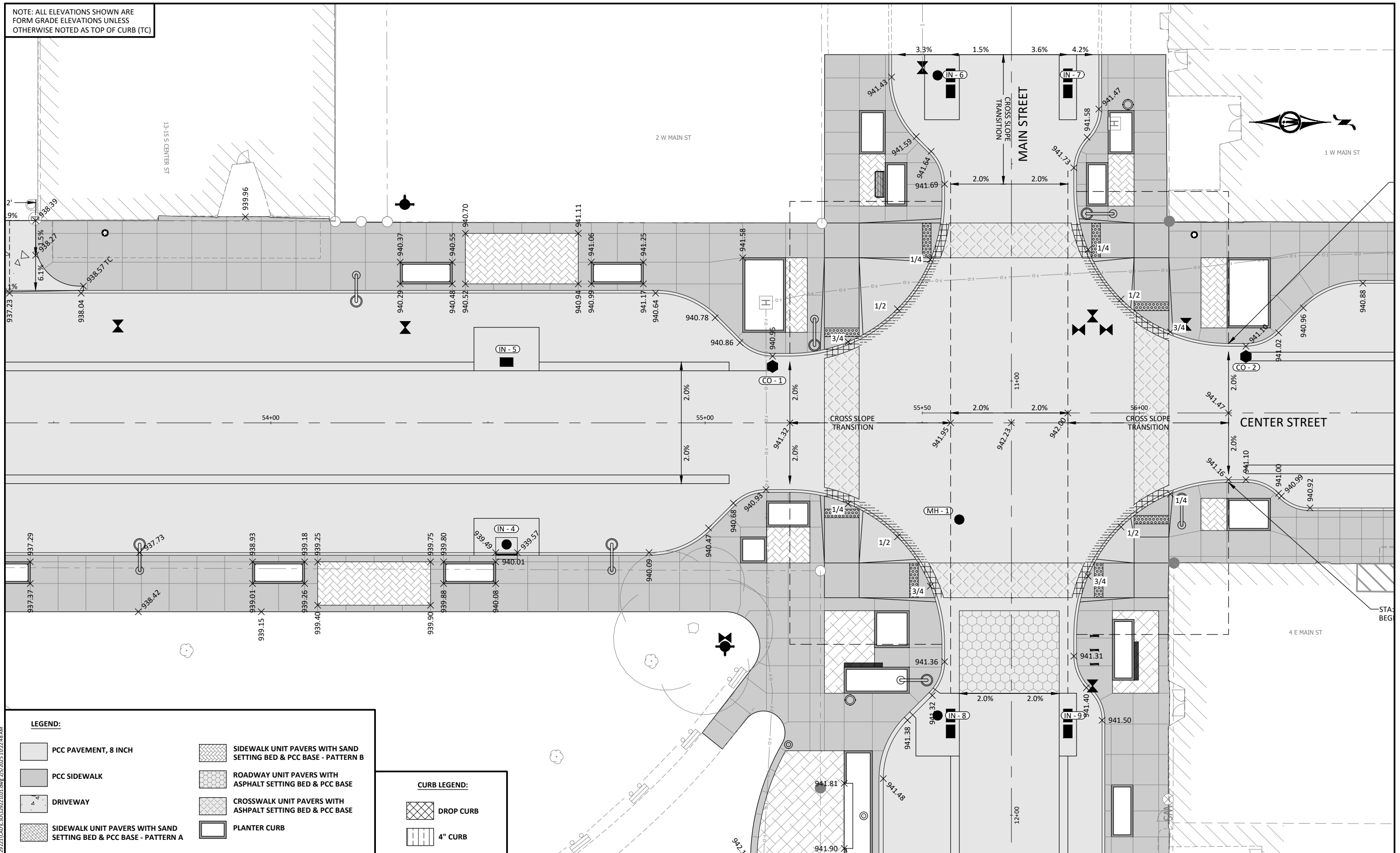
MAIN STREET RECONSTRUCTION

INTERSECTION DETAILS

SHEET

L1.07

NOTE: ALL ELEVATIONS SHOWN ARE
FORM GRADE ELEVATIONS UNLESS
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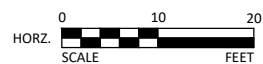
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LEGEND:

- | | | | |
|---|---|---|---|
|  | PCC PAVEMENT, 8 INCH |  | SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN B |
|  | PCC SIDEWALK |  | ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE |
|  | DRIVEWAY |  | CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE |
|  | SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN A |  | PLANTER CURB |

CURB LEGEND:

-  **DROP CURB**
-  **4" CURB**



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CLIENT PROJ. NO. 0A1.129221			

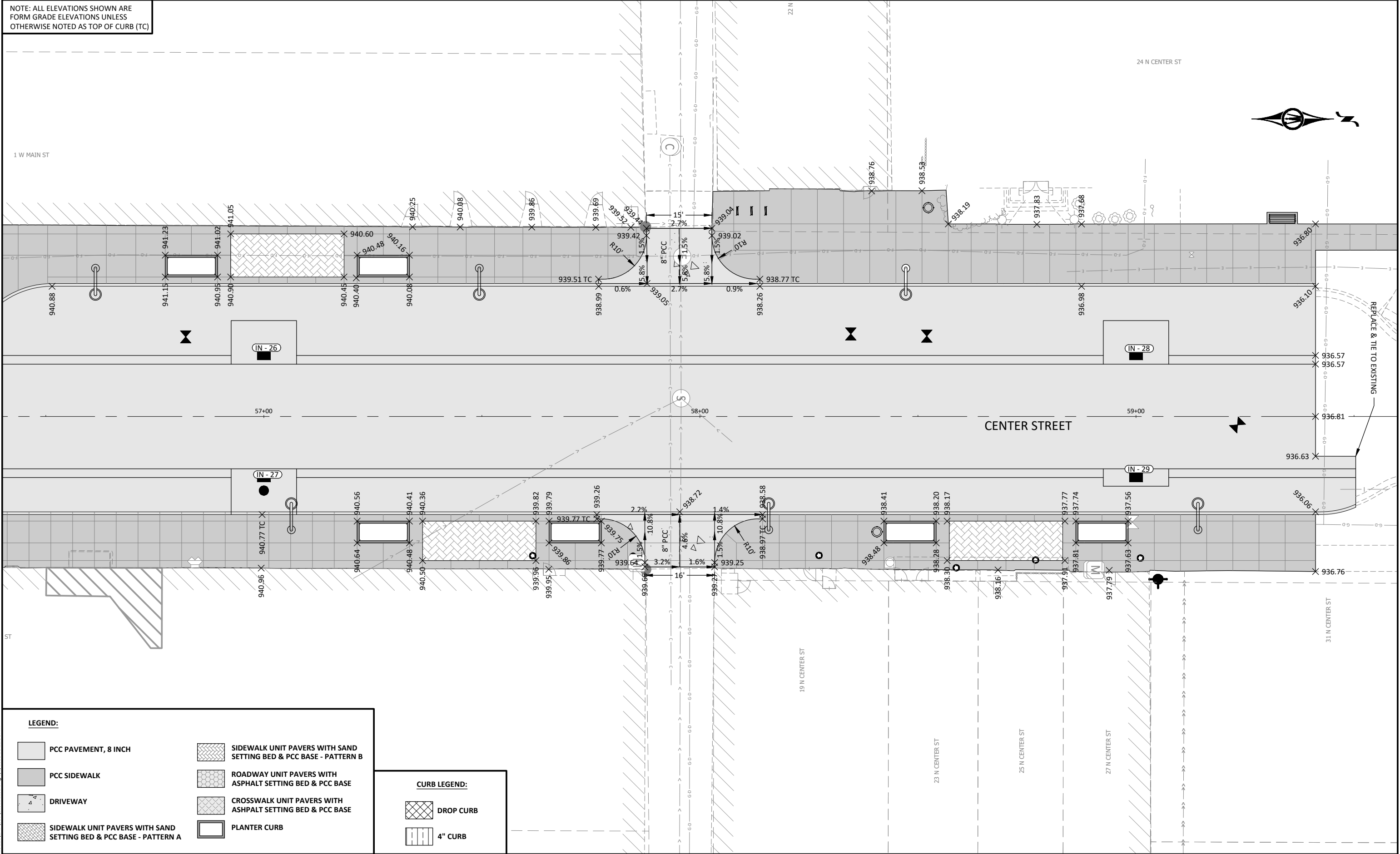
CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

INTERSECTION DETAILS

SHEET

1.08

NOTE: ALL ELEVATIONS SHOWN ARE
FORM GRADE ELEVATIONS UNLESS
OTHERWISE NOTED AS TOP OF CURB (TC)



LEGEND:

PCC PAVEMENT, 8 INCH

PCC SIDEWALK

DRIVEWAY

SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN A

SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE - PATTERN B

ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE

CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE

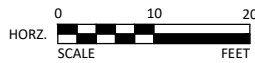
PLANTER CURB

CURB LEGEND:

DROP CURB

4" CURB

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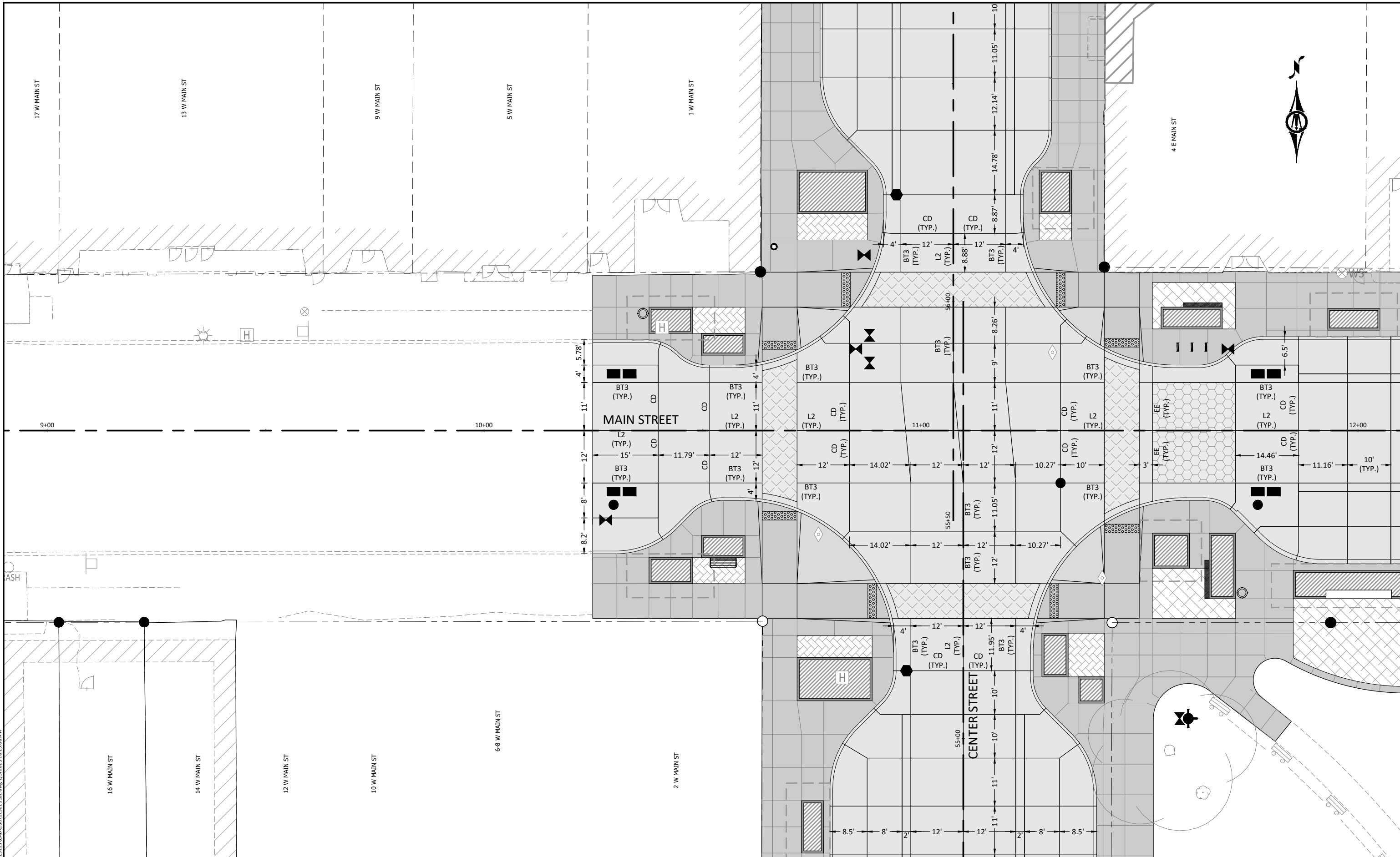
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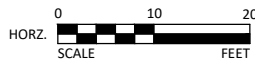
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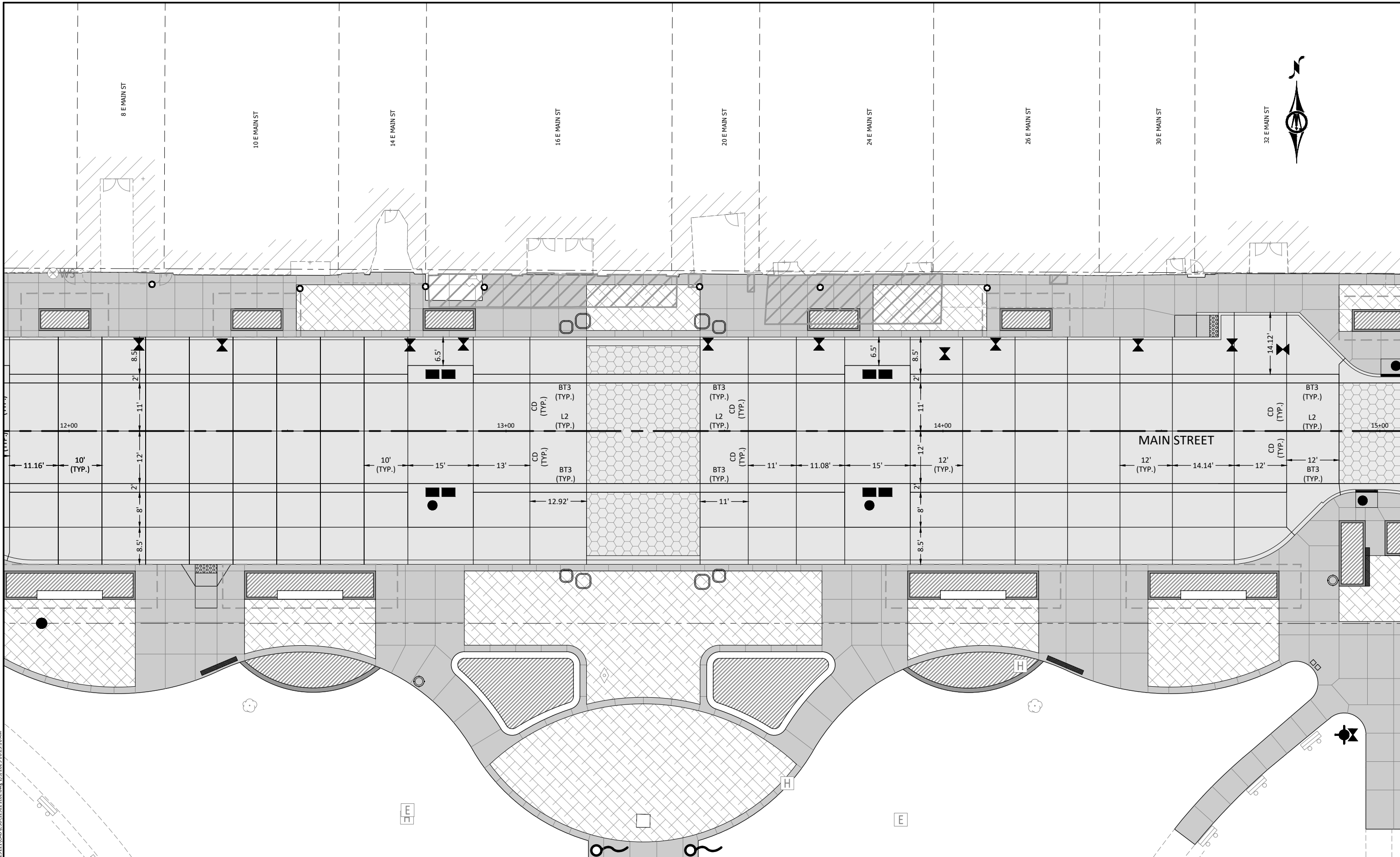


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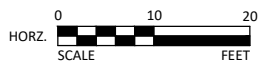
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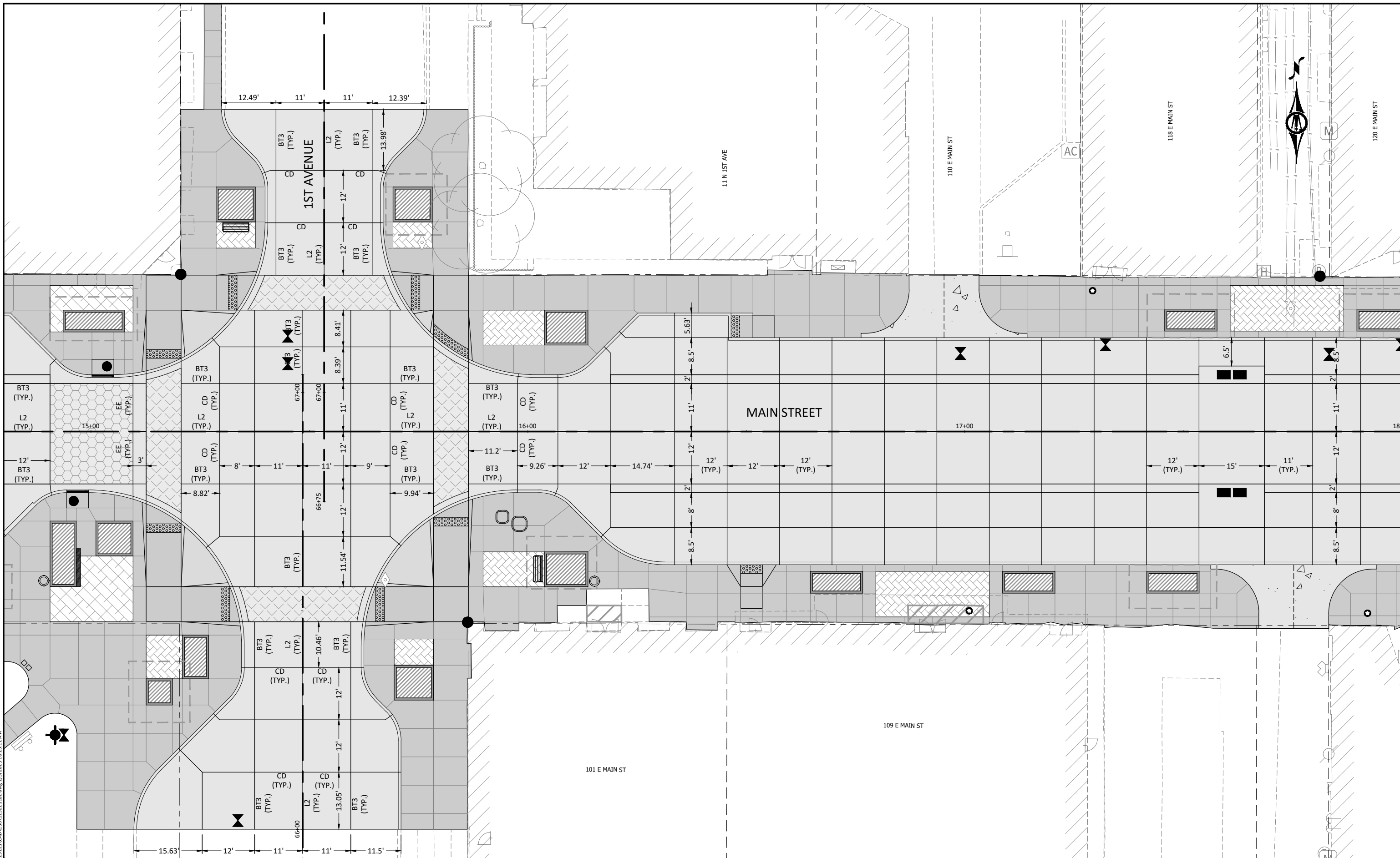
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CITY OF MARSHALLTOWN, IOWA
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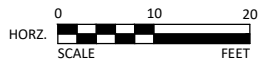
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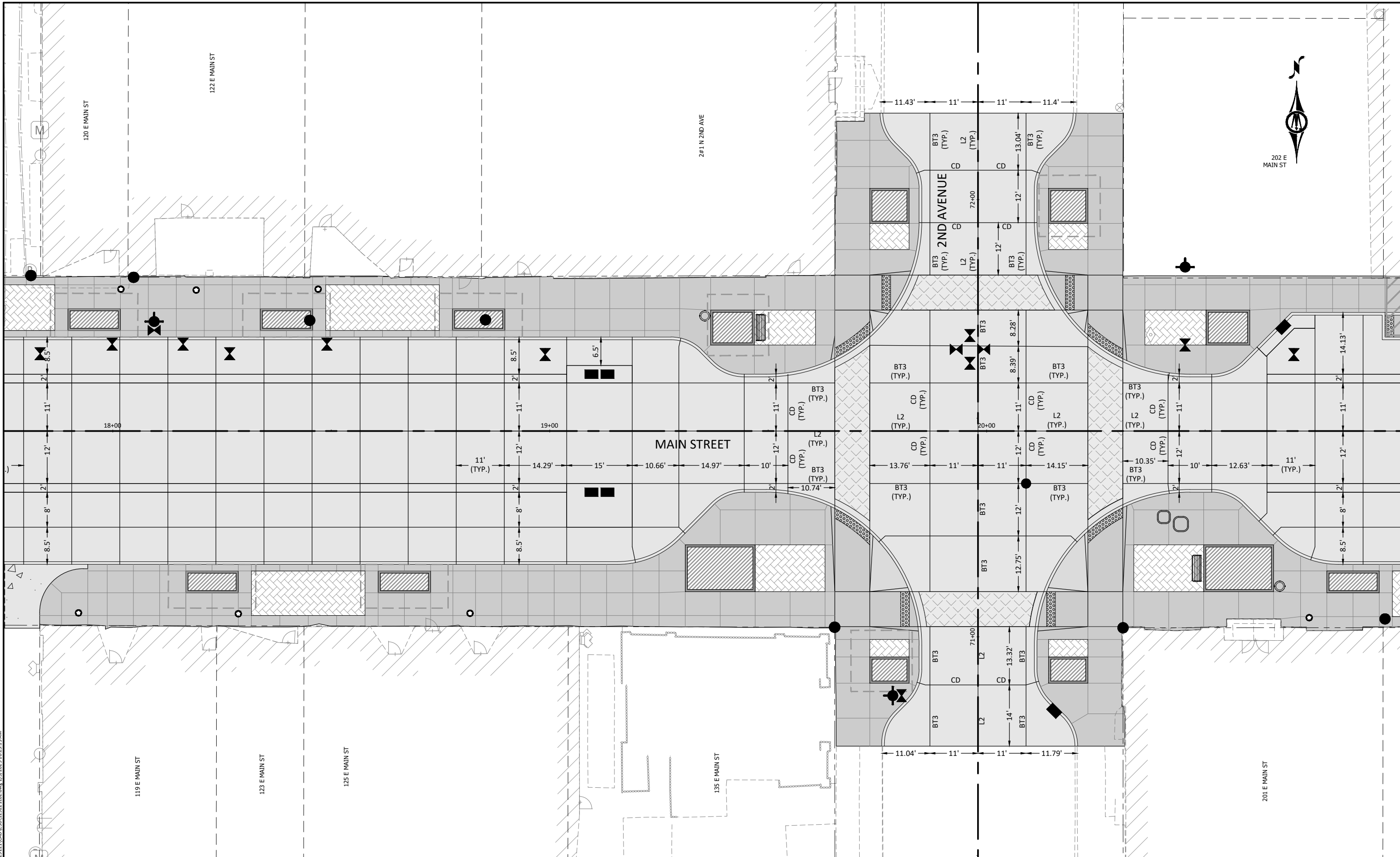


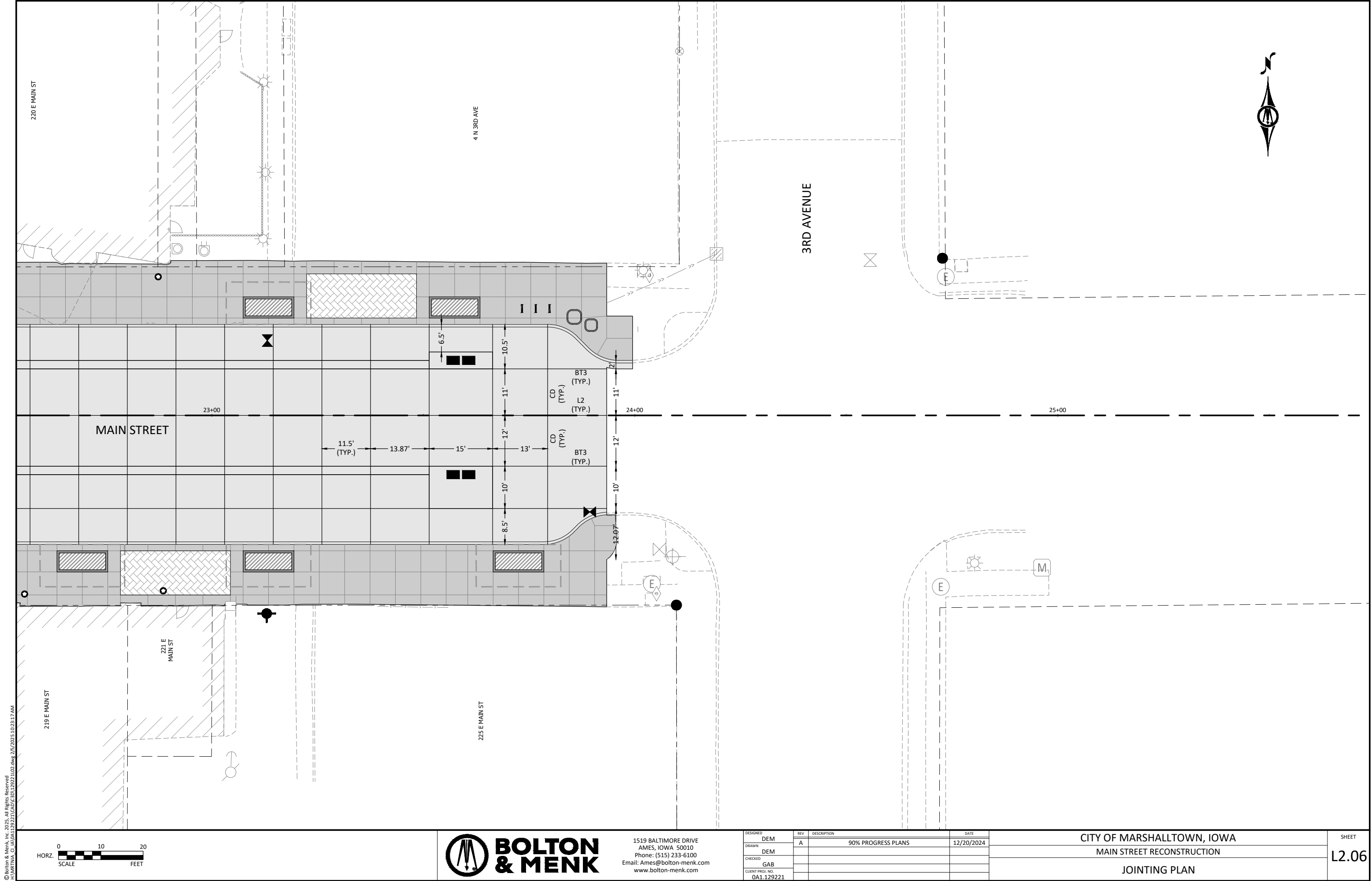
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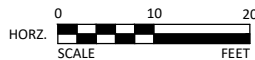
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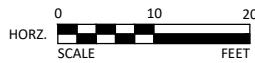
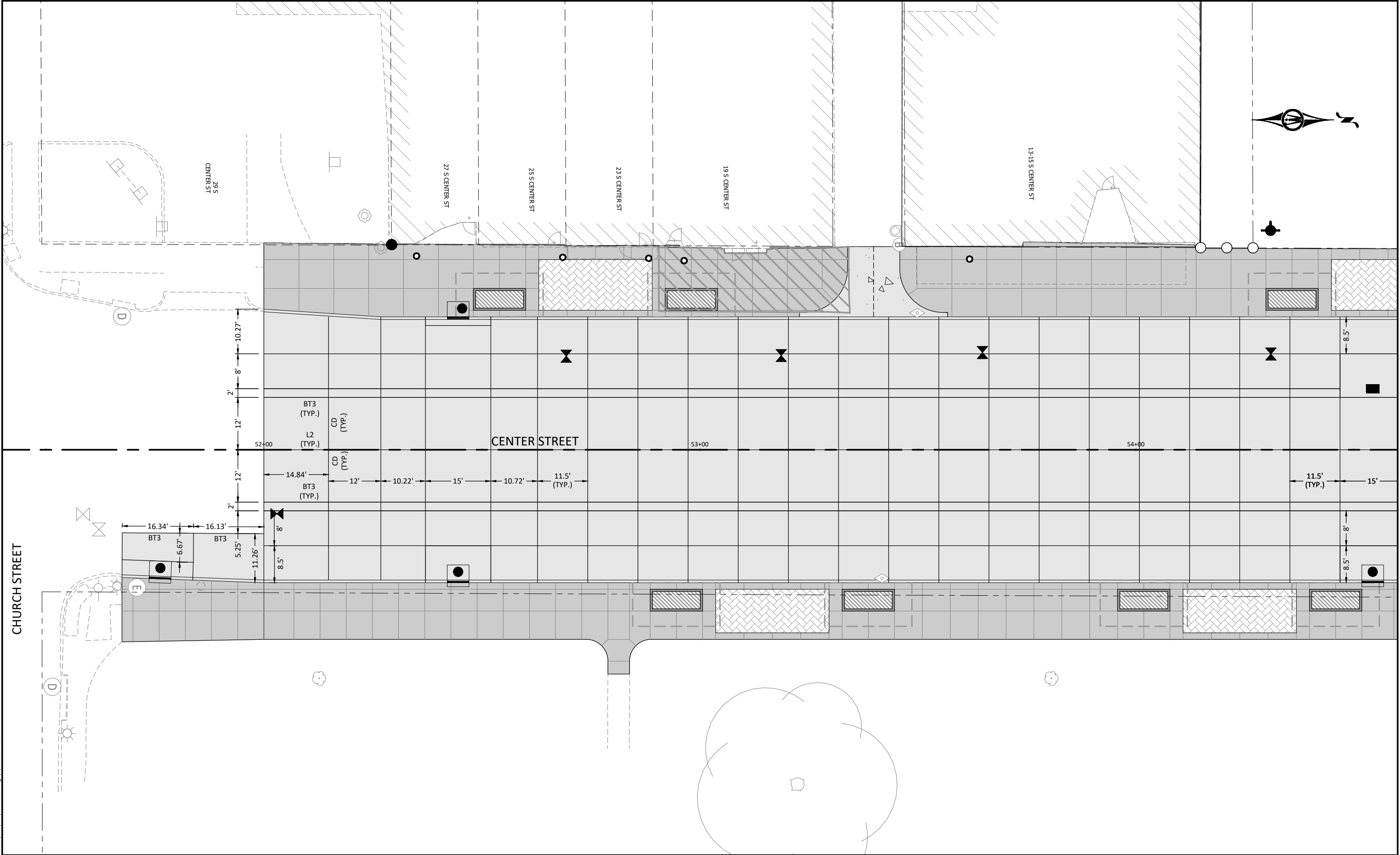
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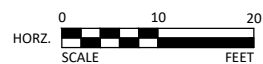
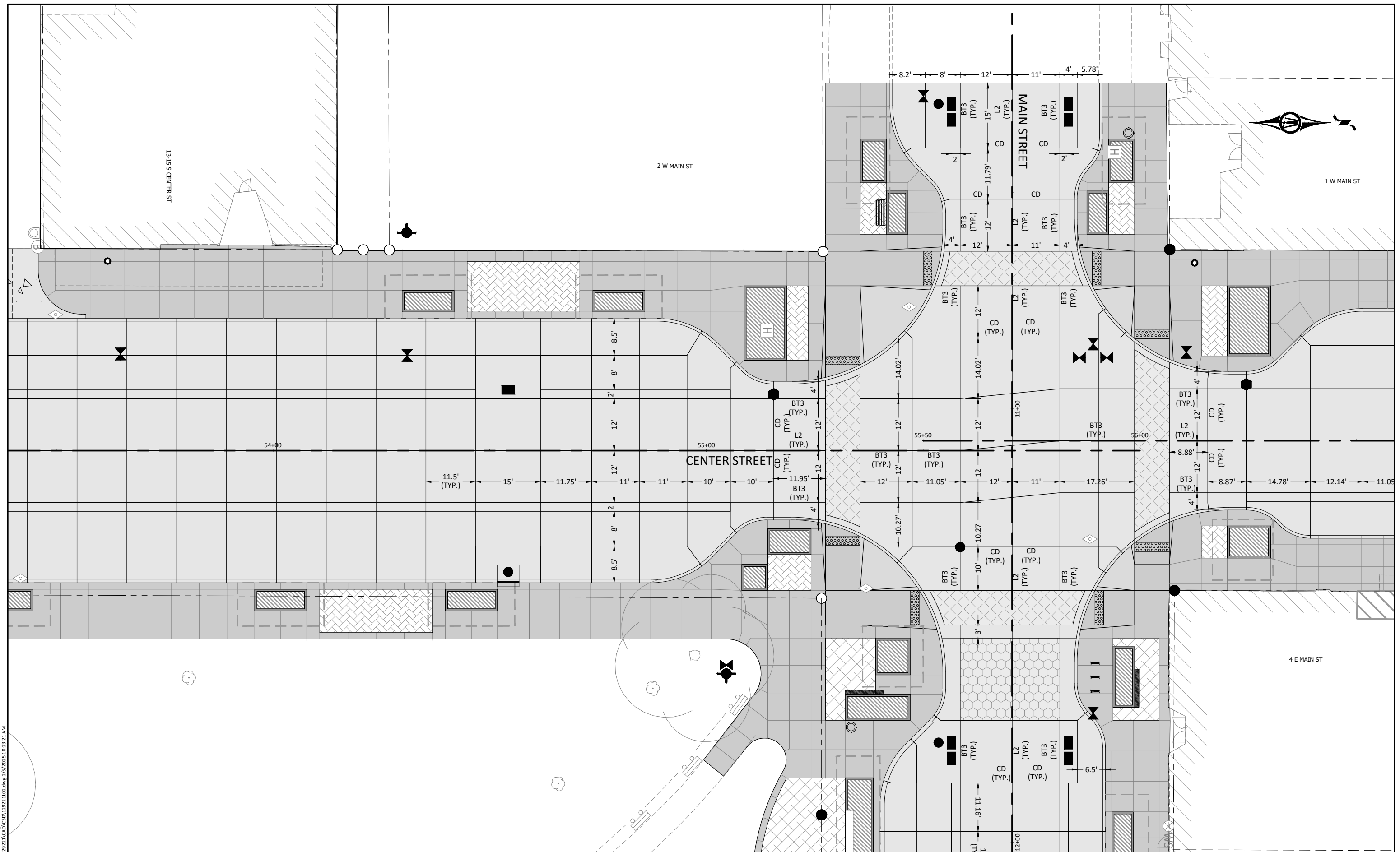


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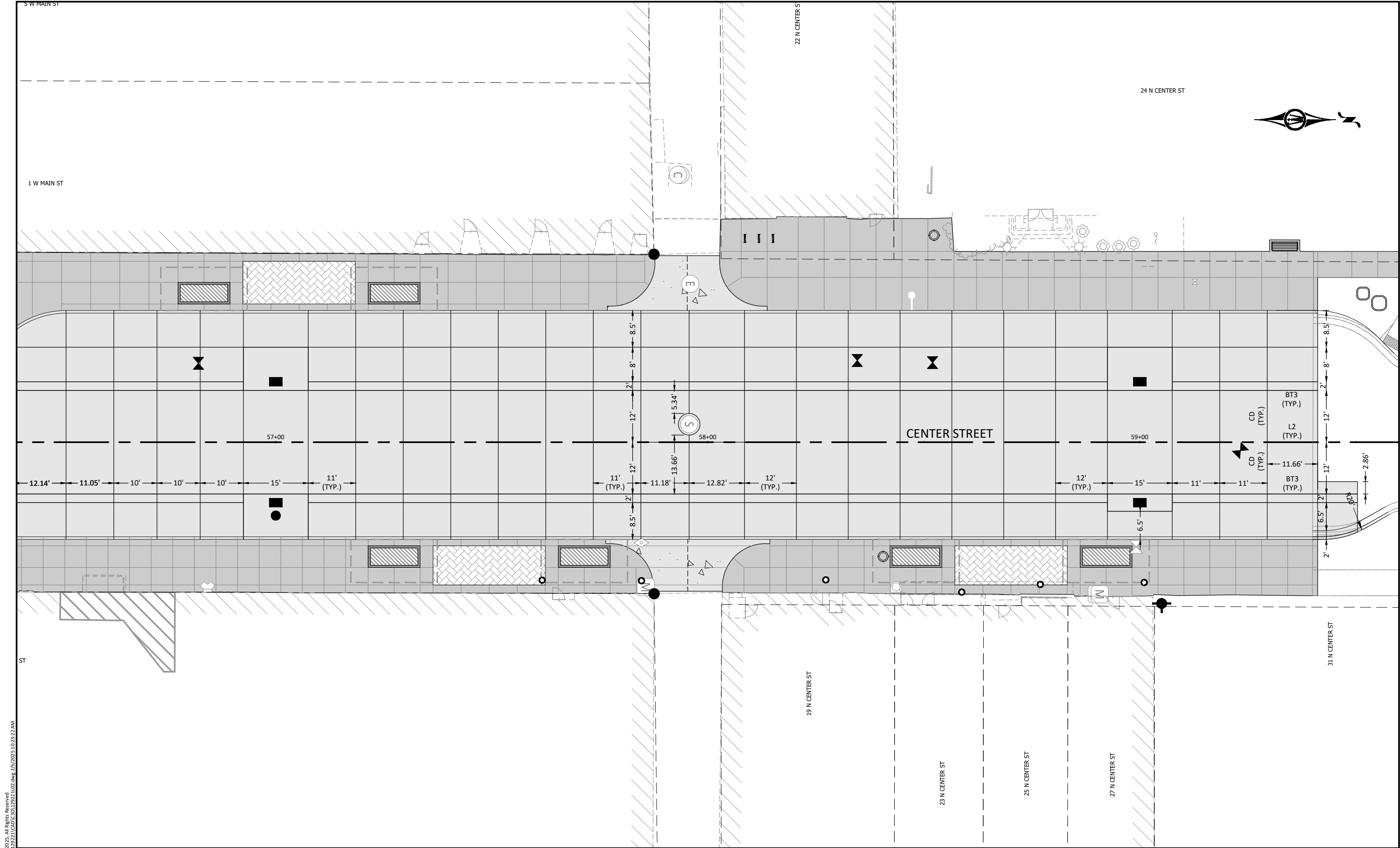
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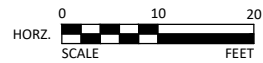
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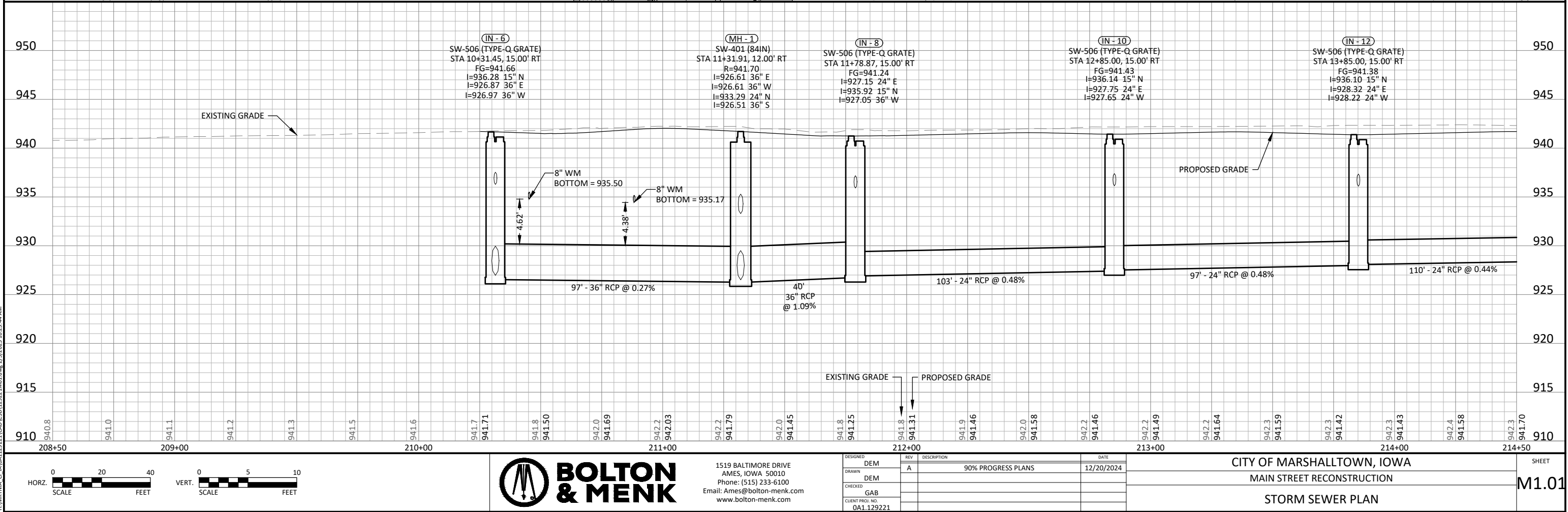
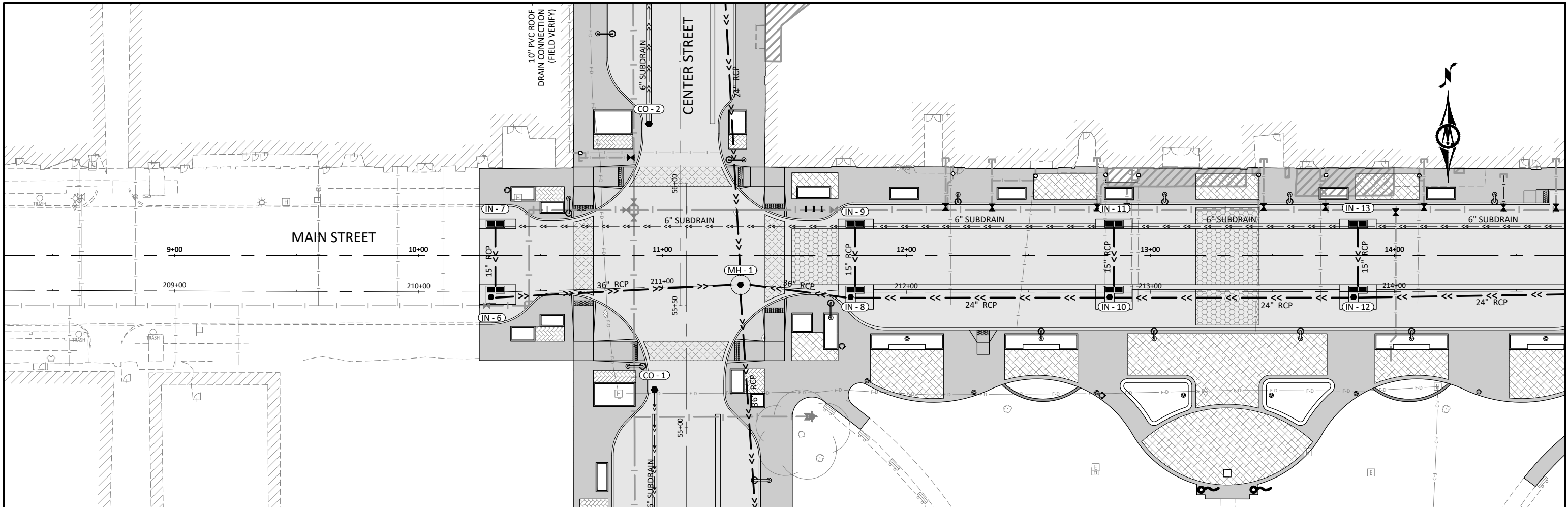
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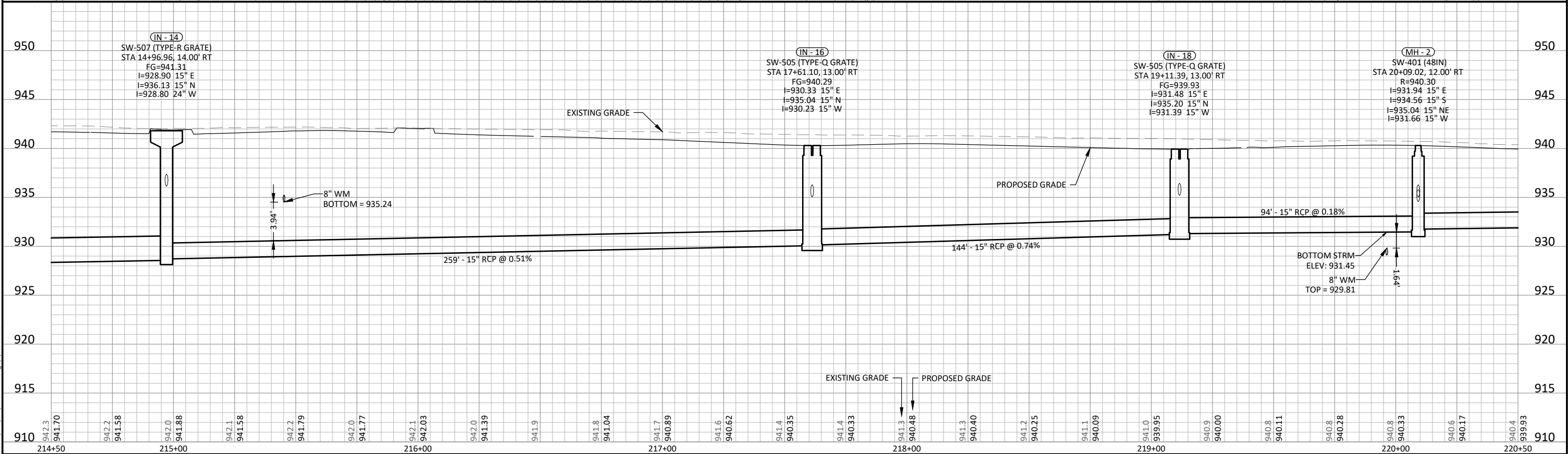
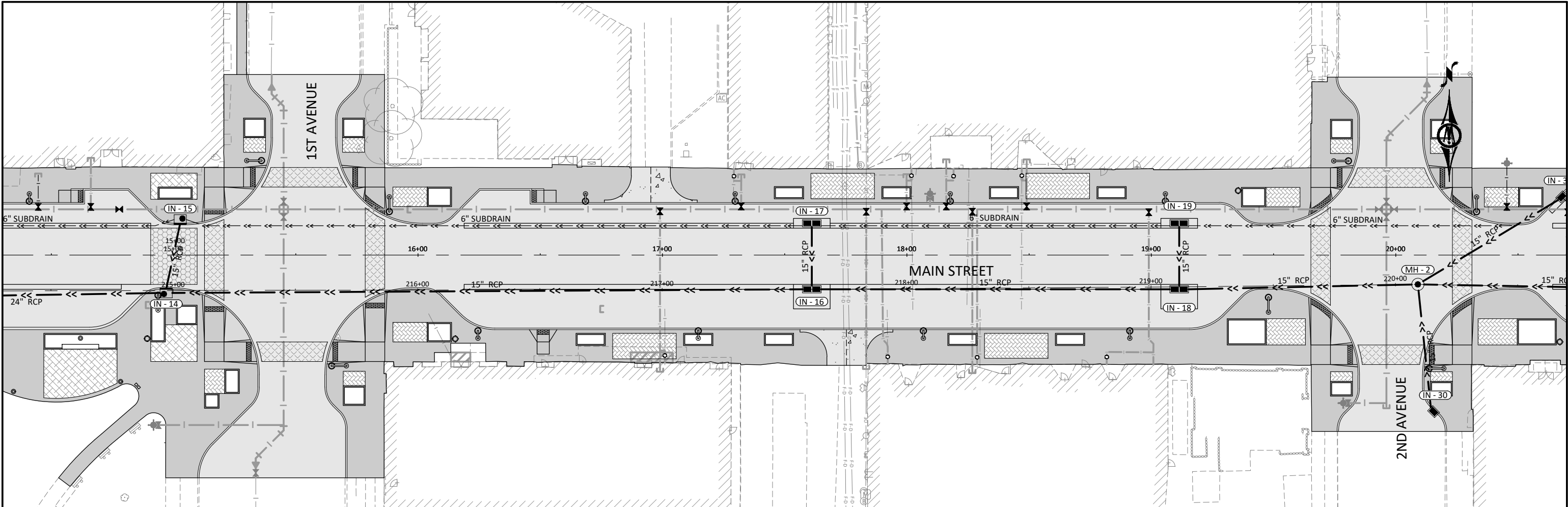
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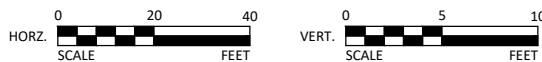
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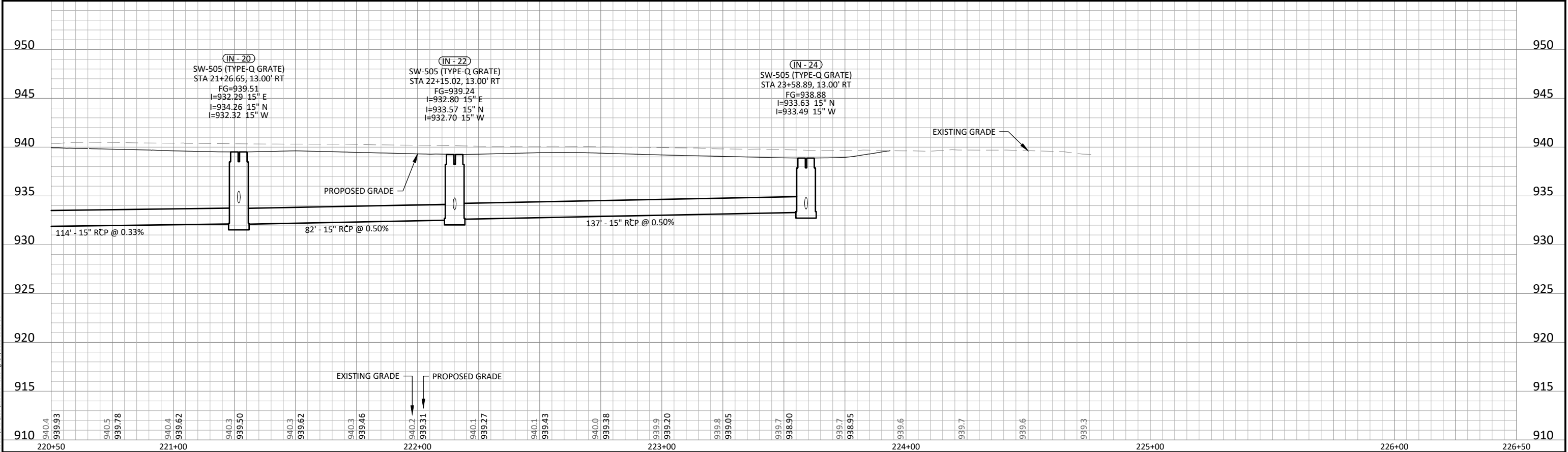
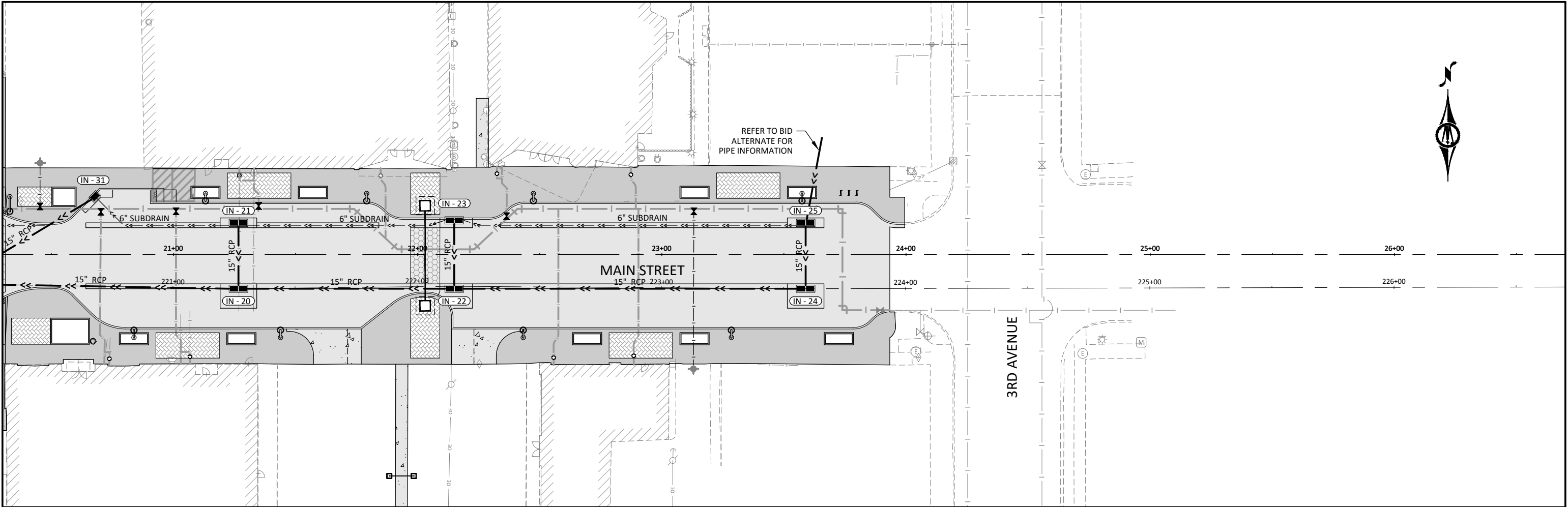


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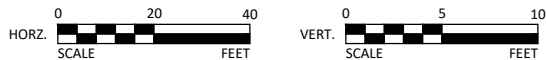
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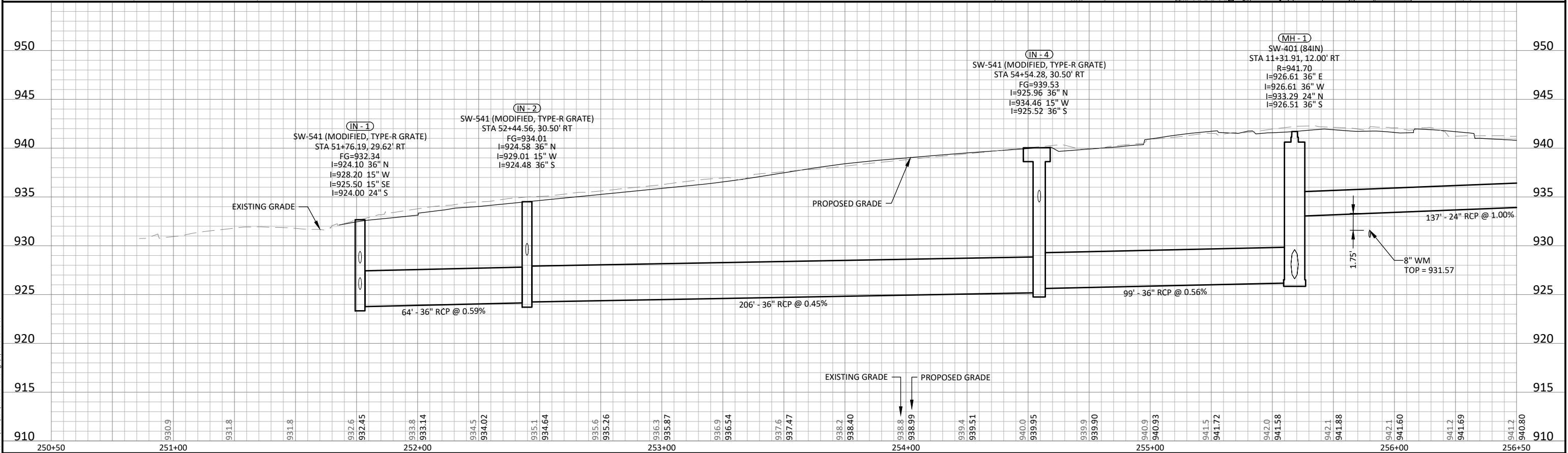
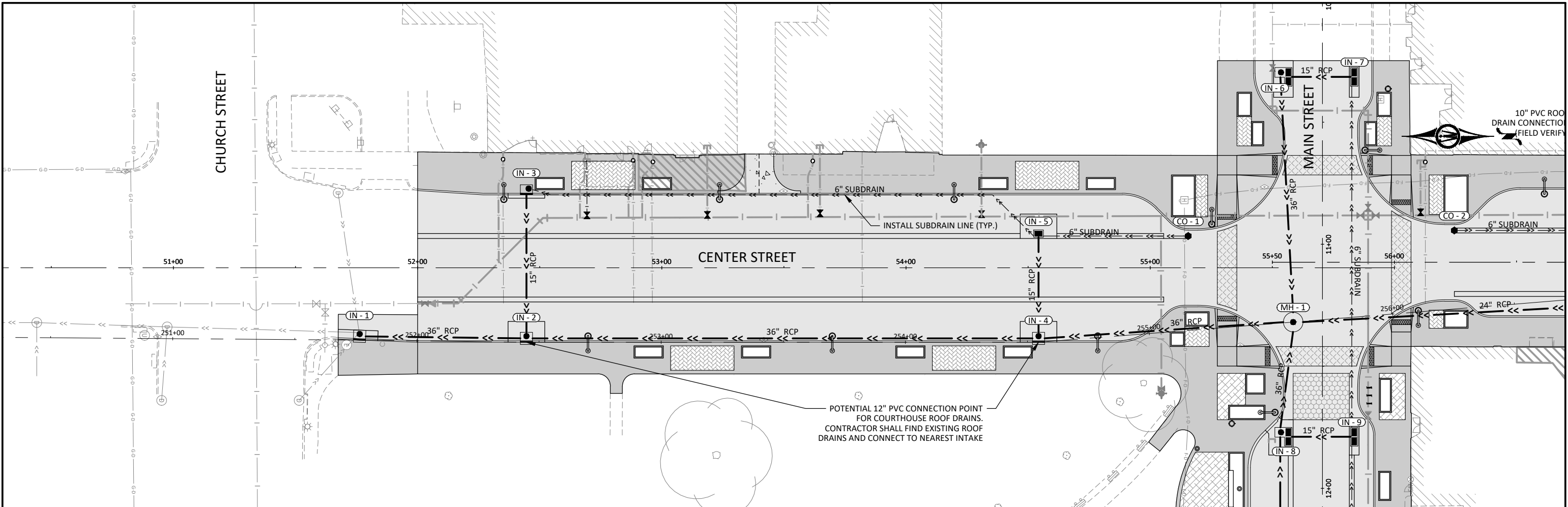


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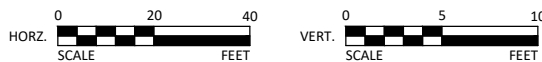
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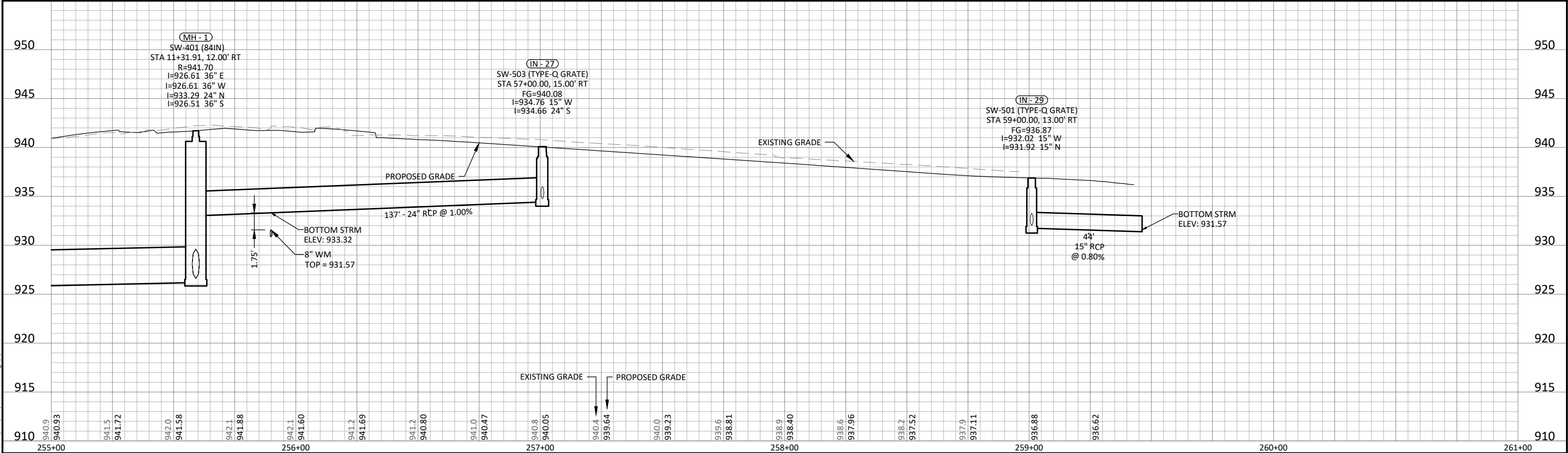
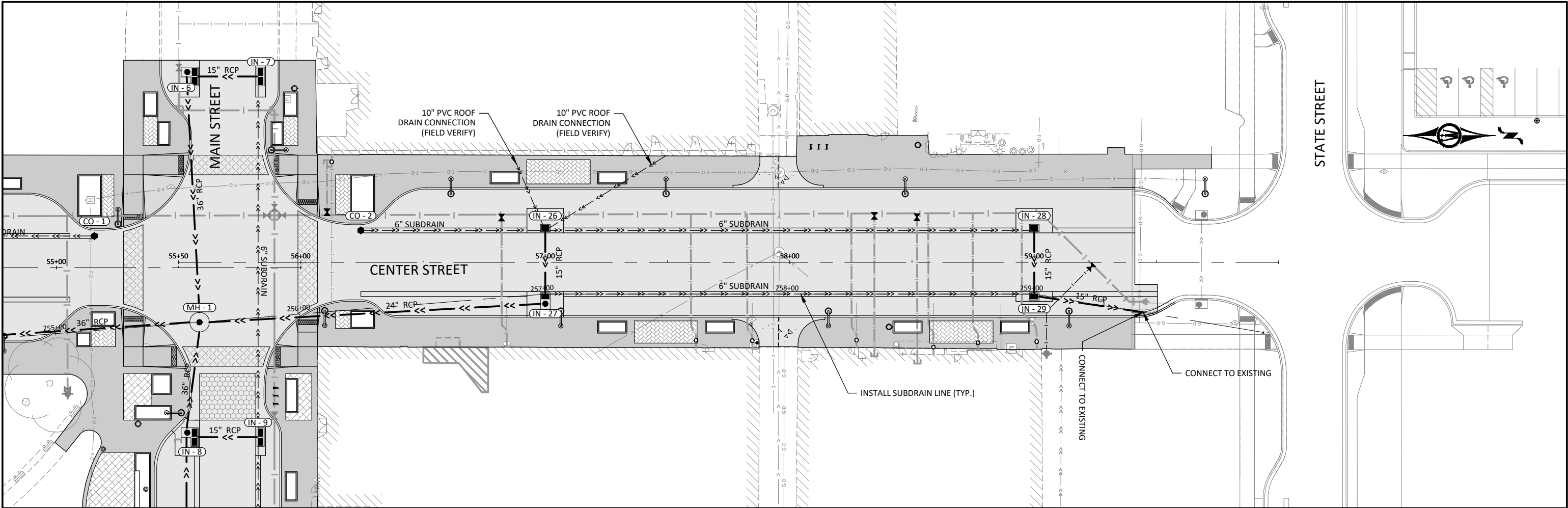


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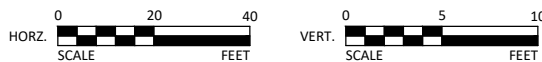
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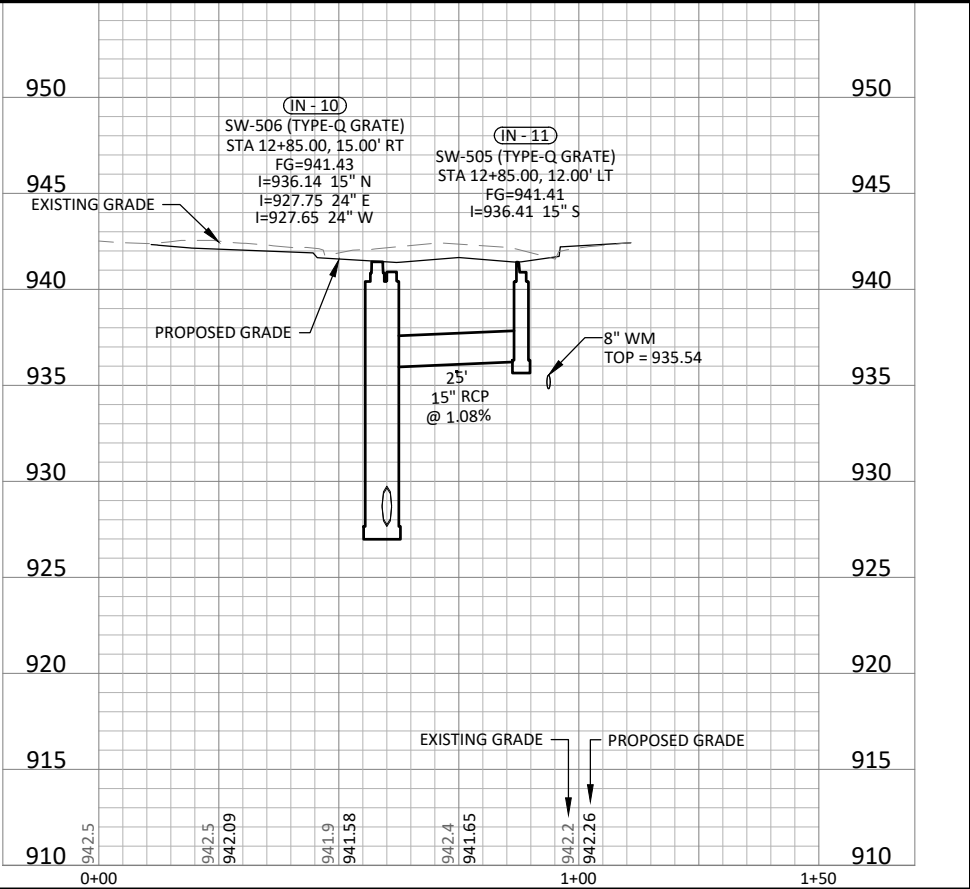
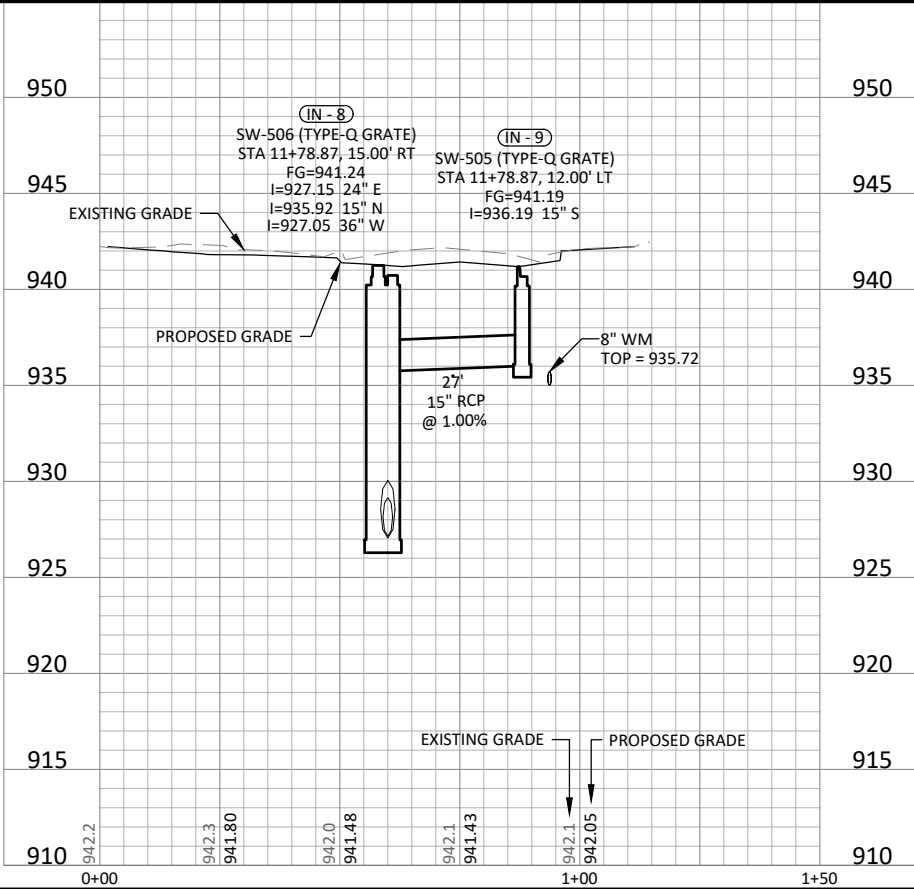
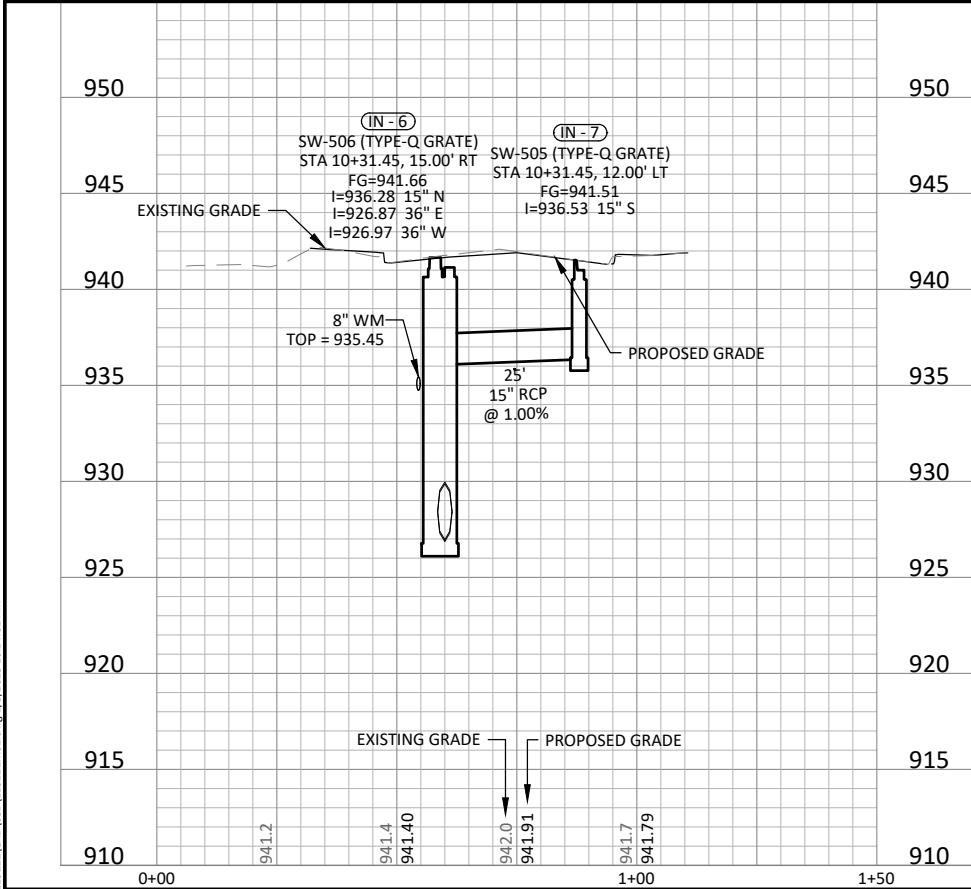
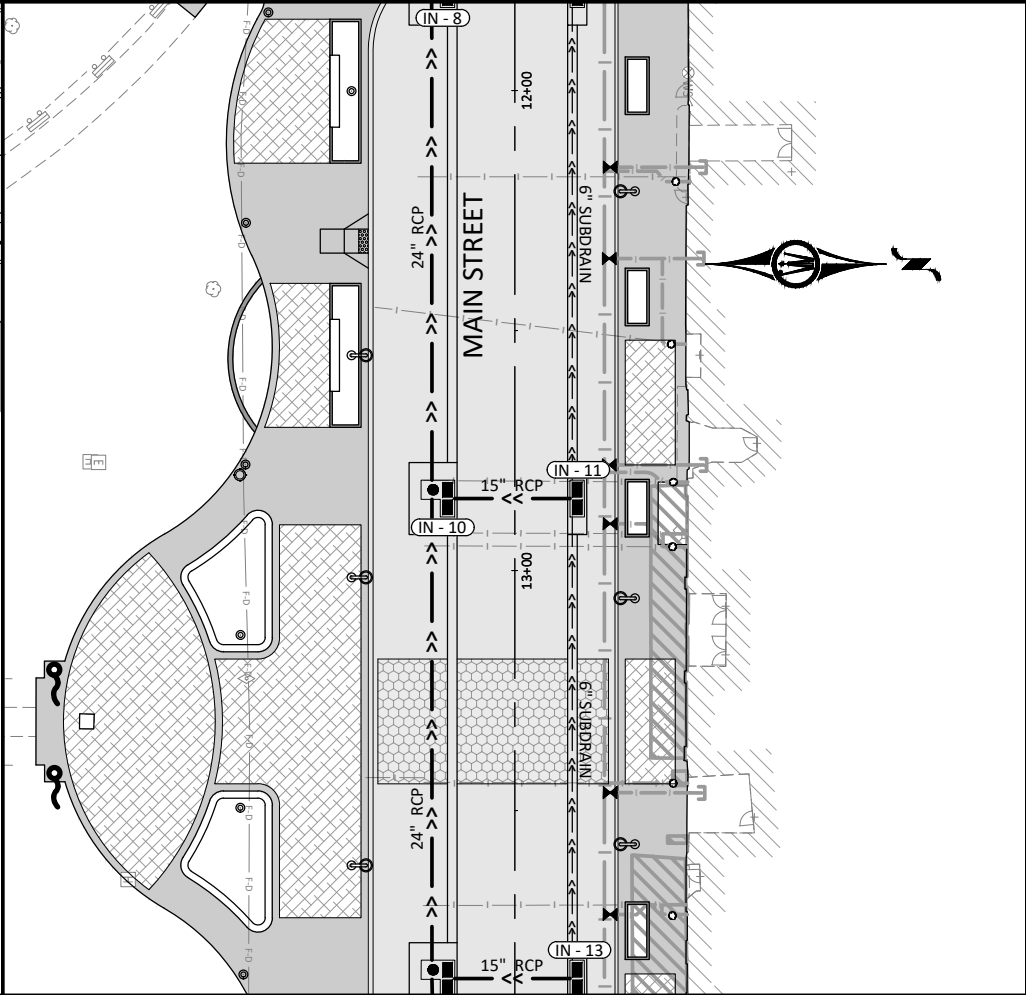
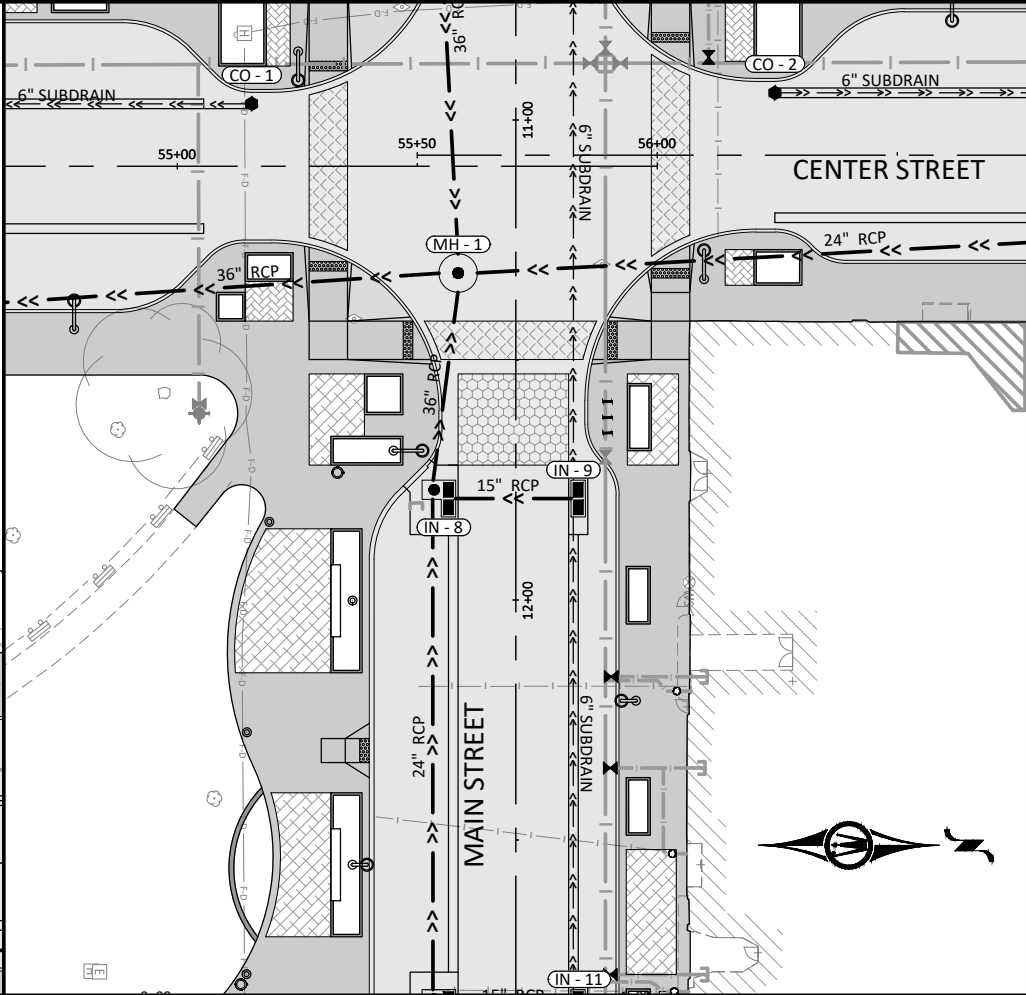
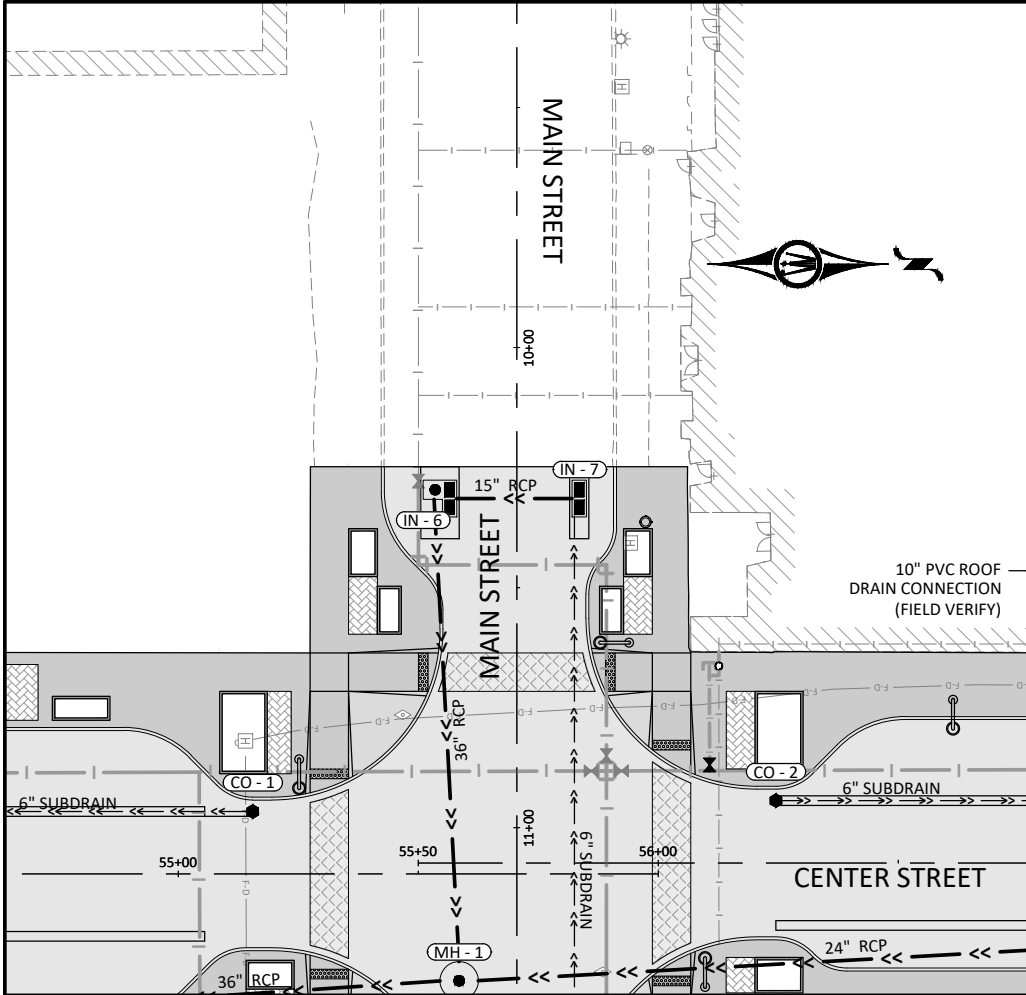


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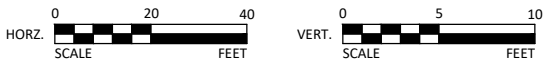
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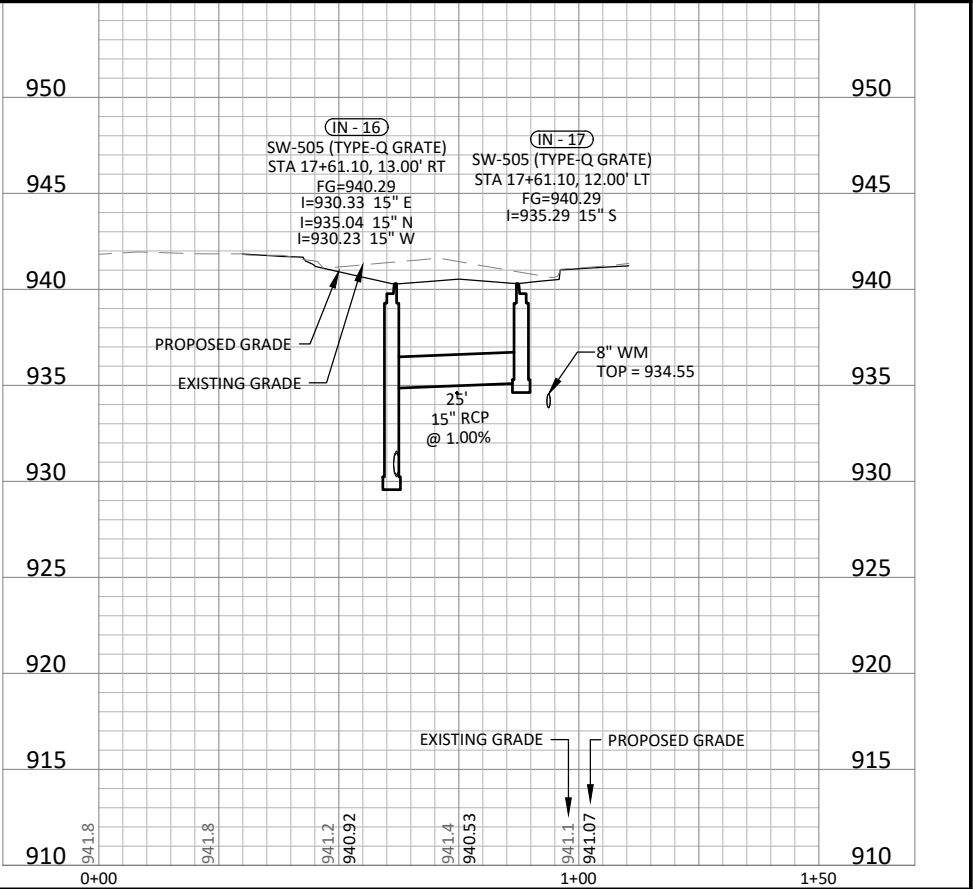
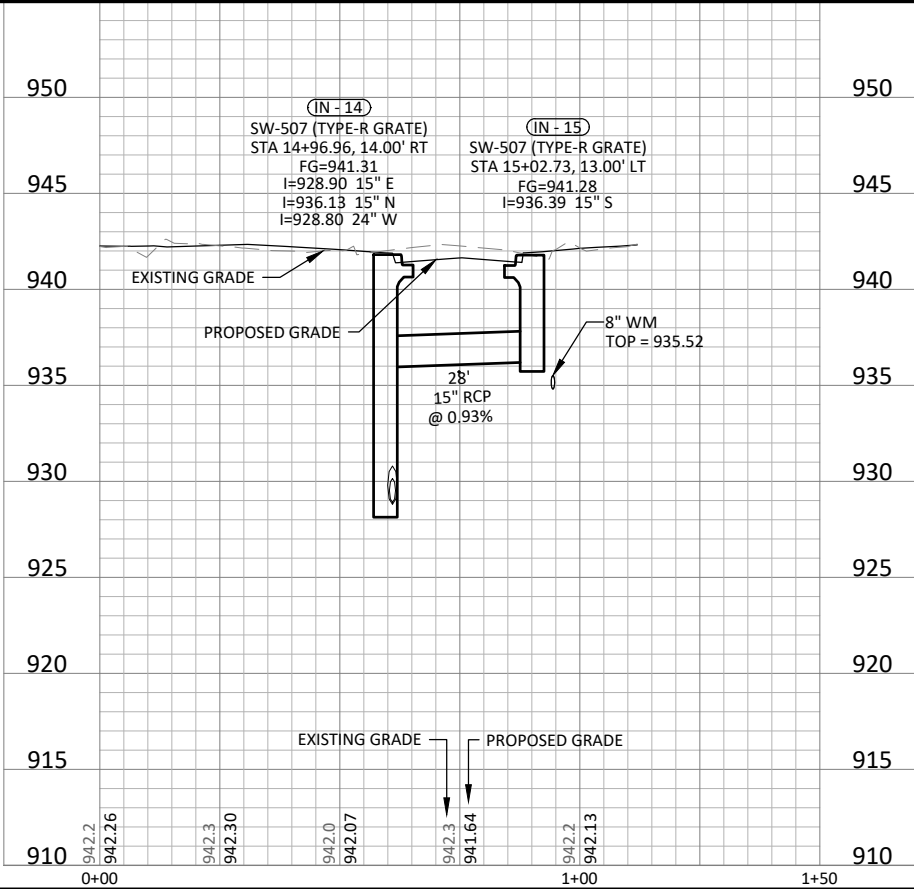
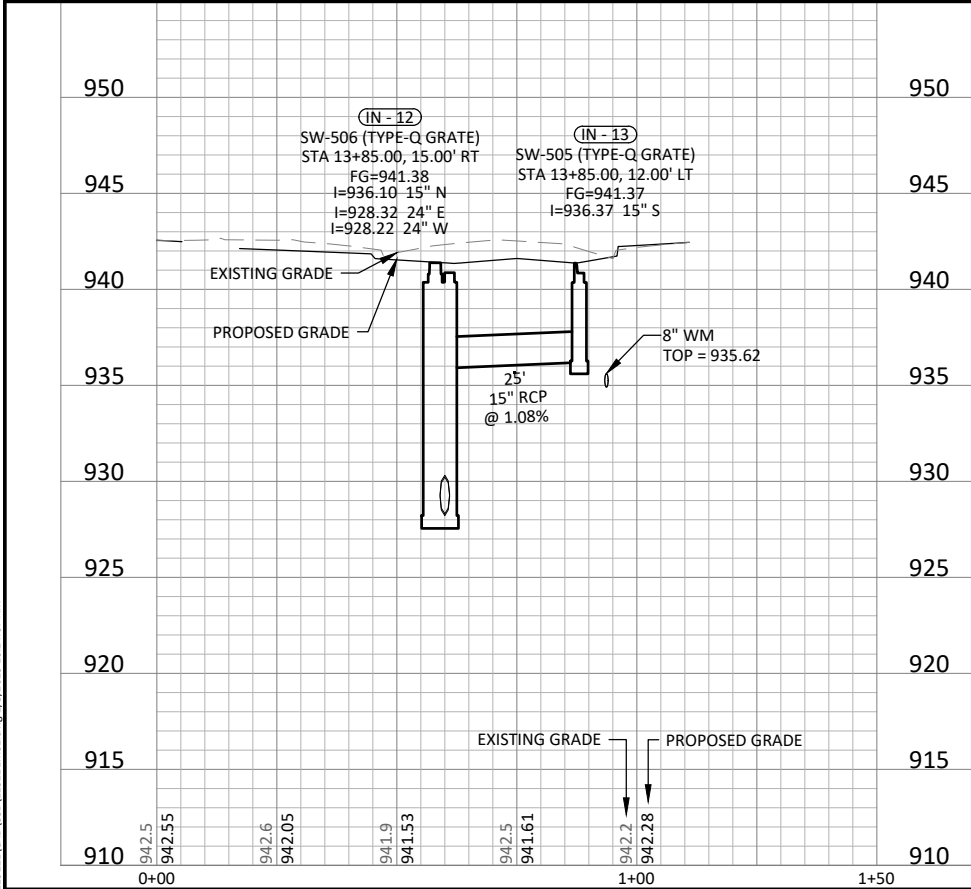
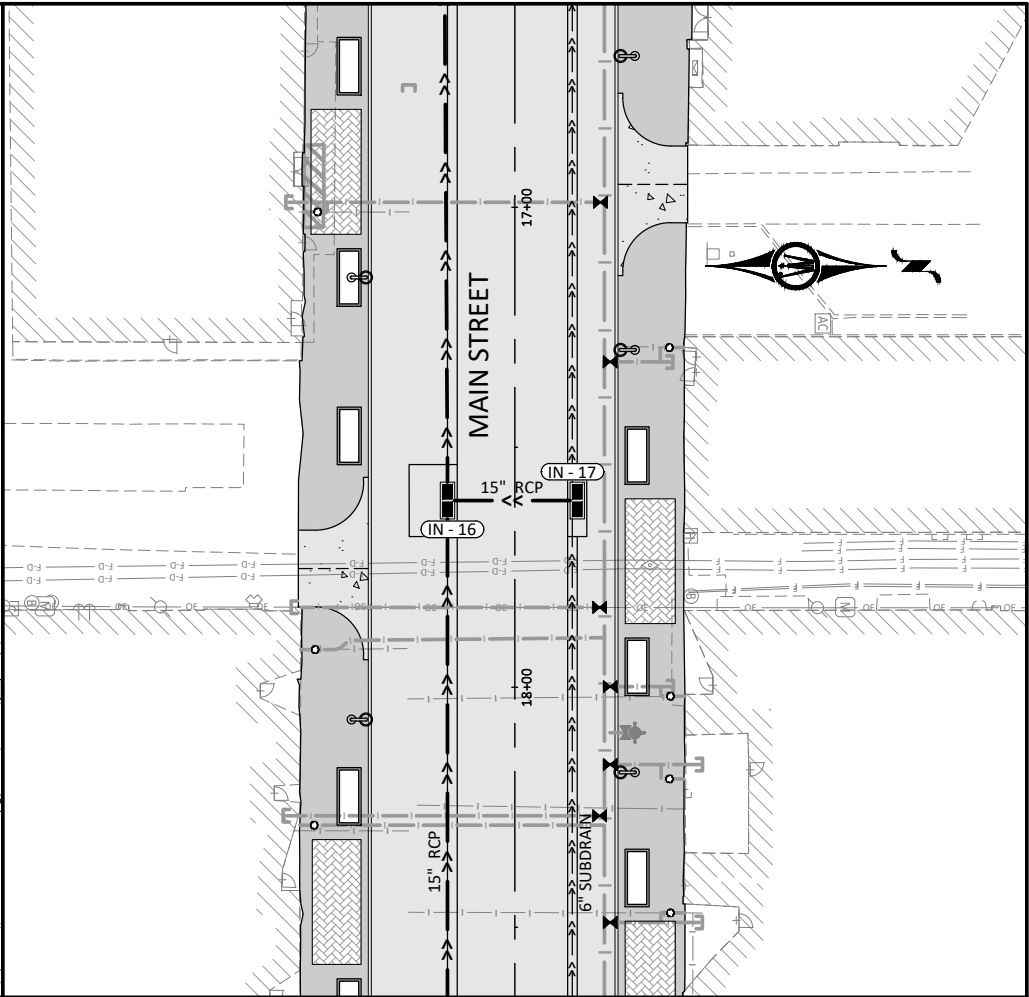
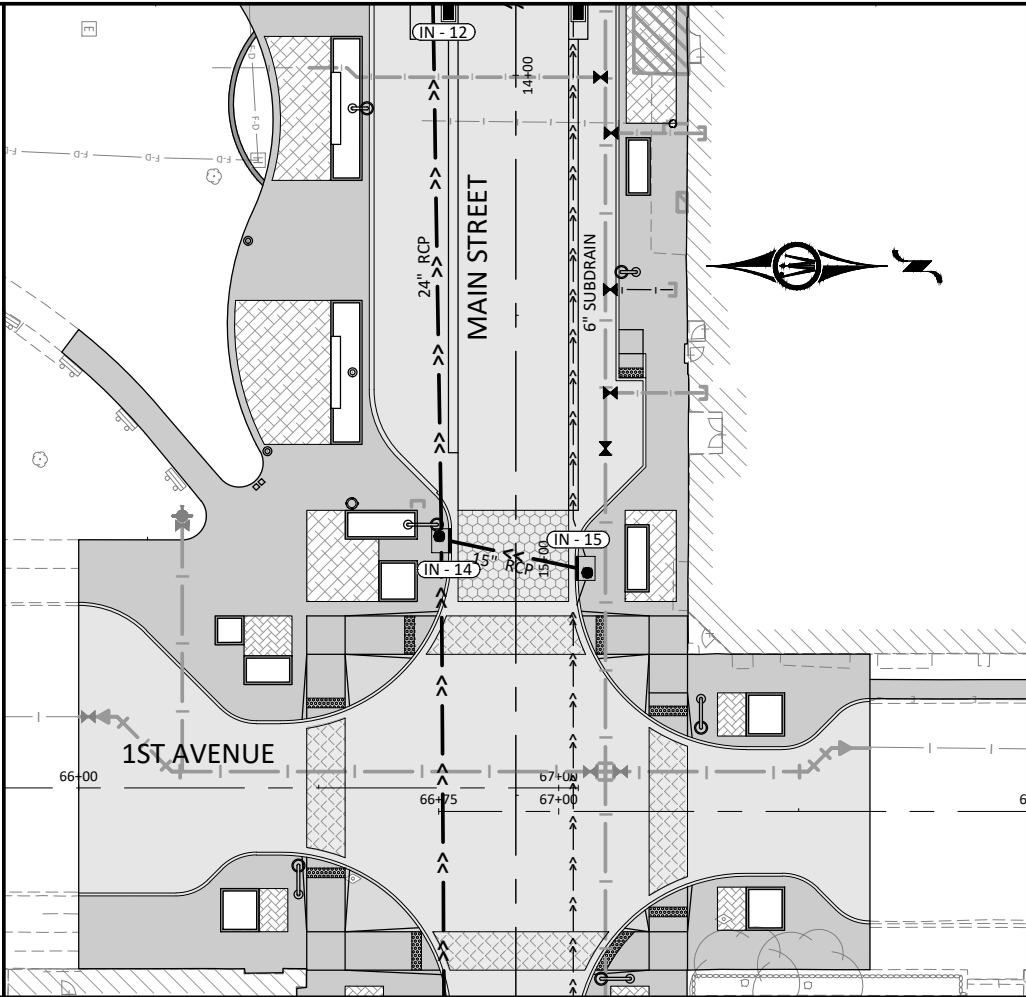
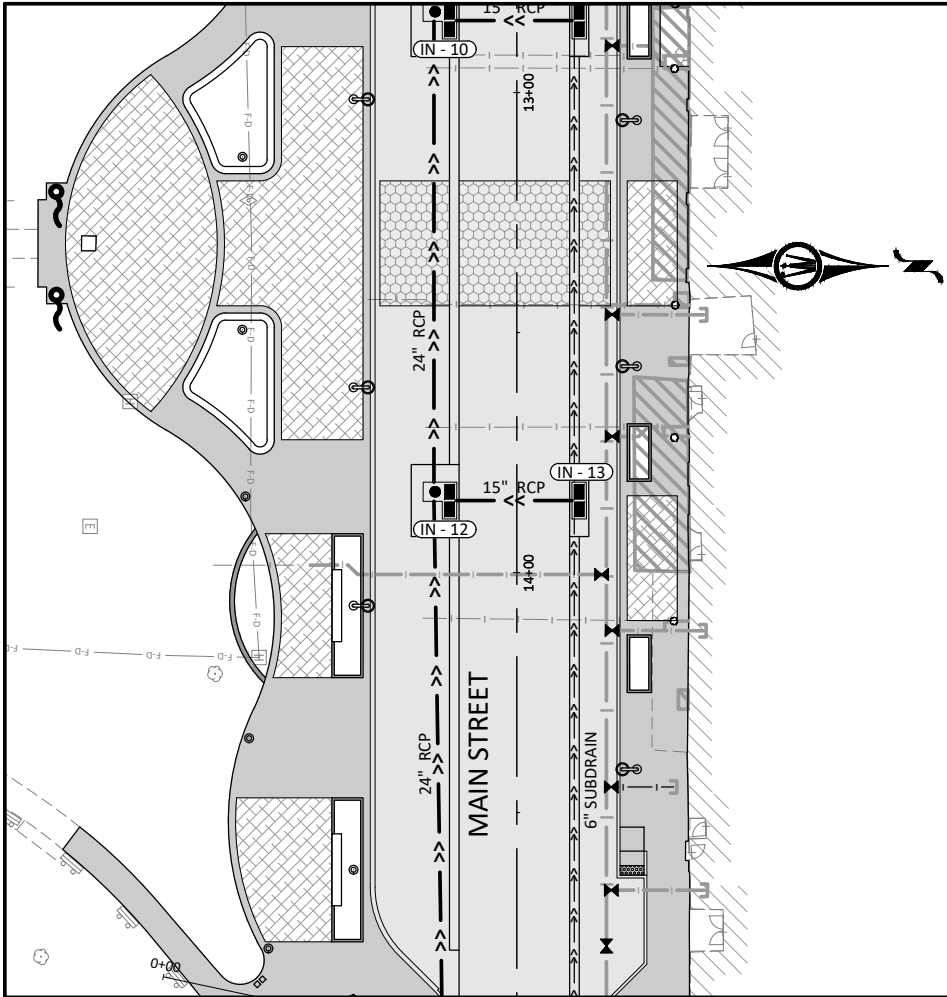
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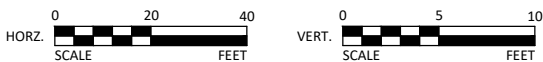
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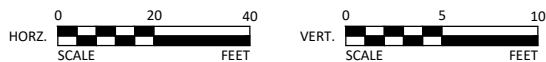
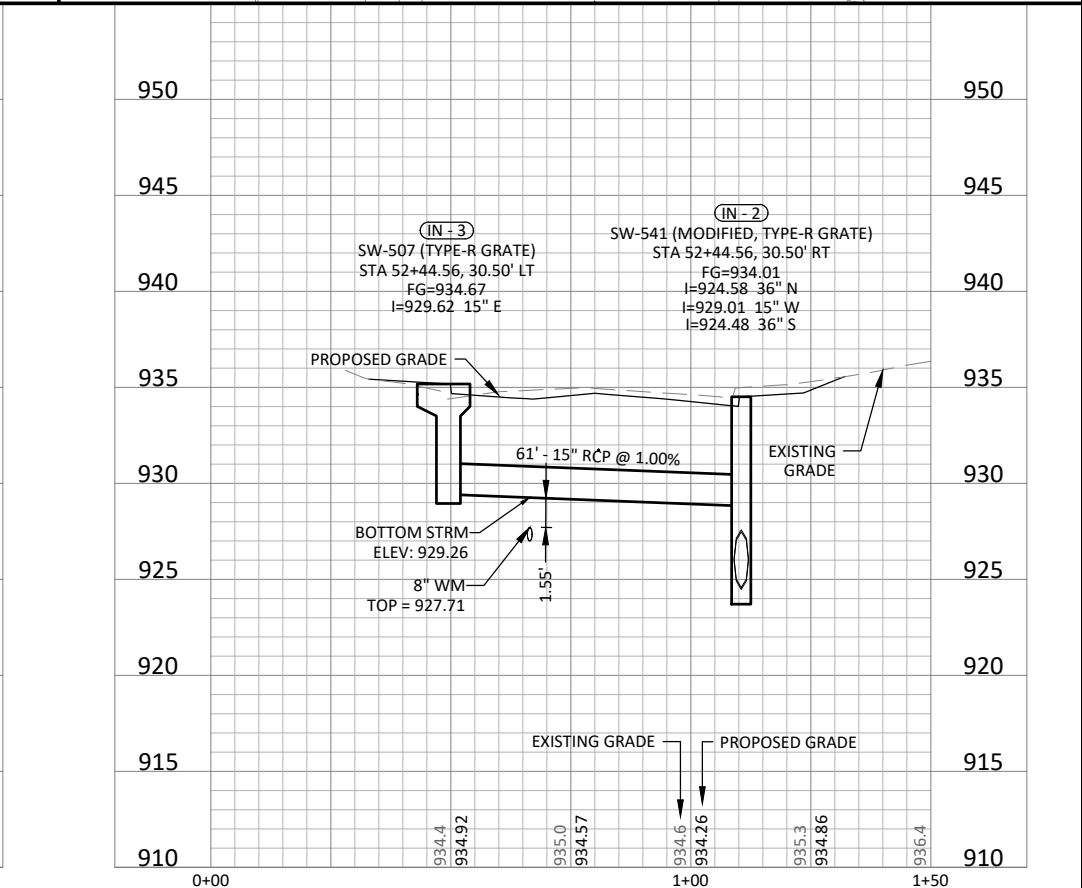
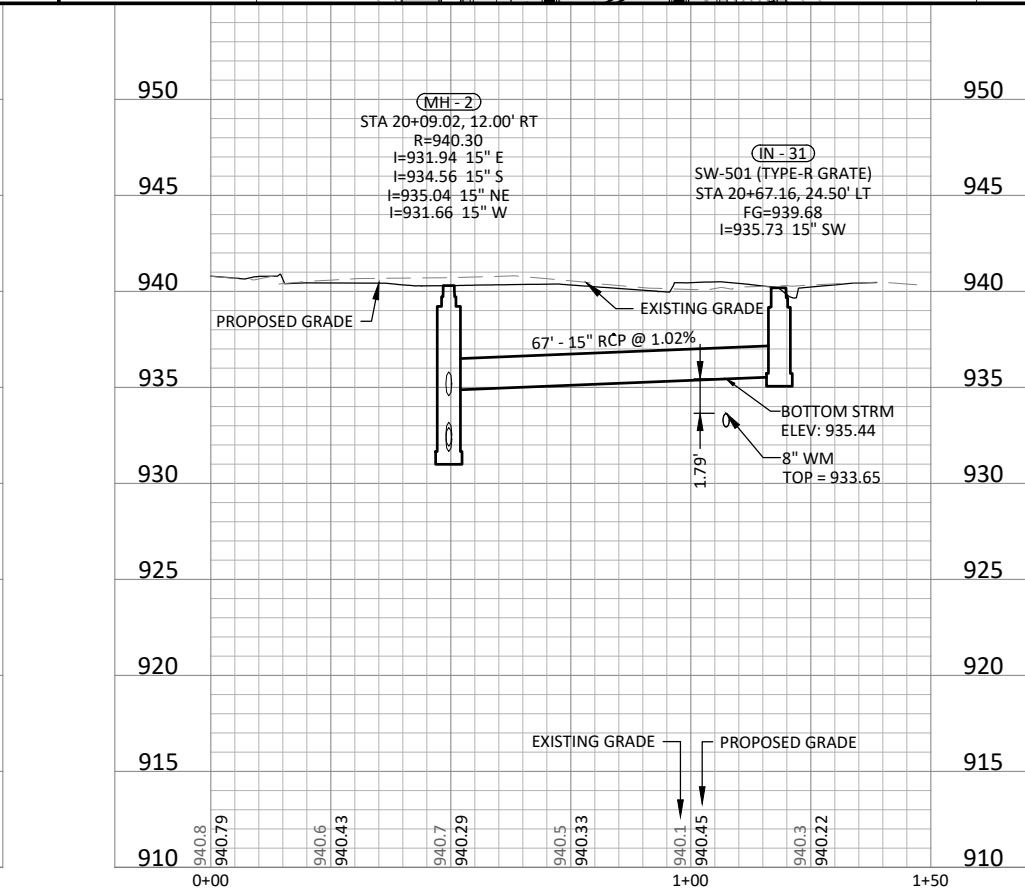
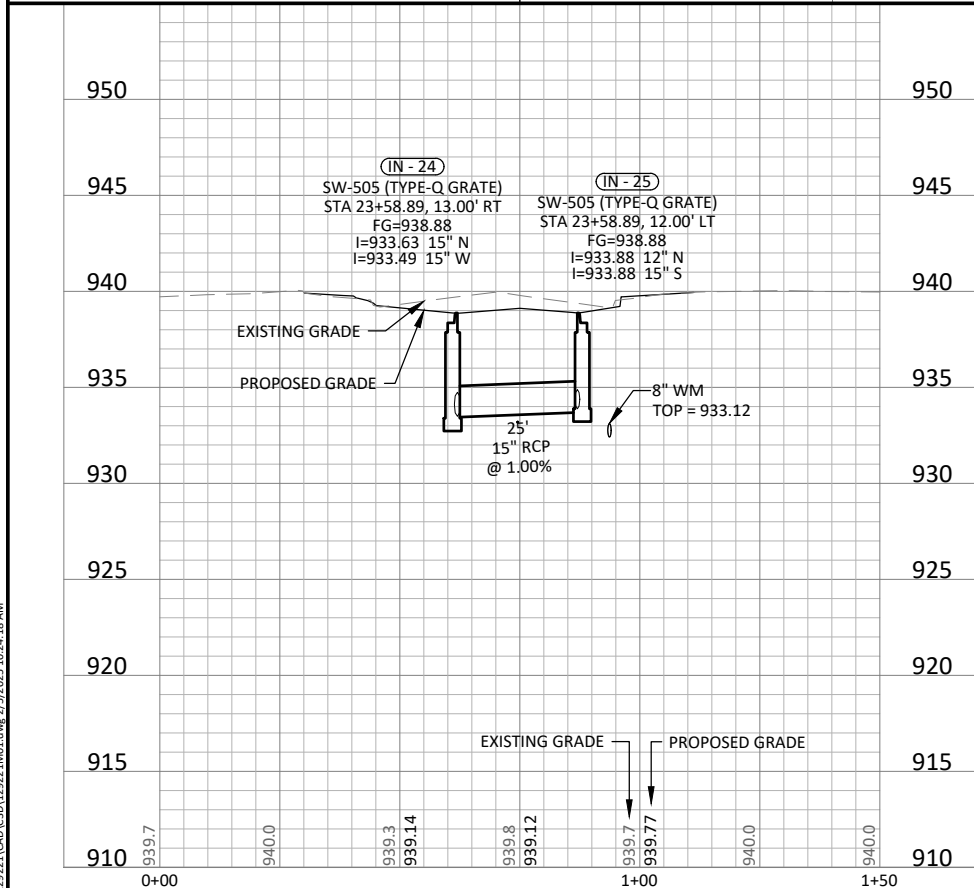
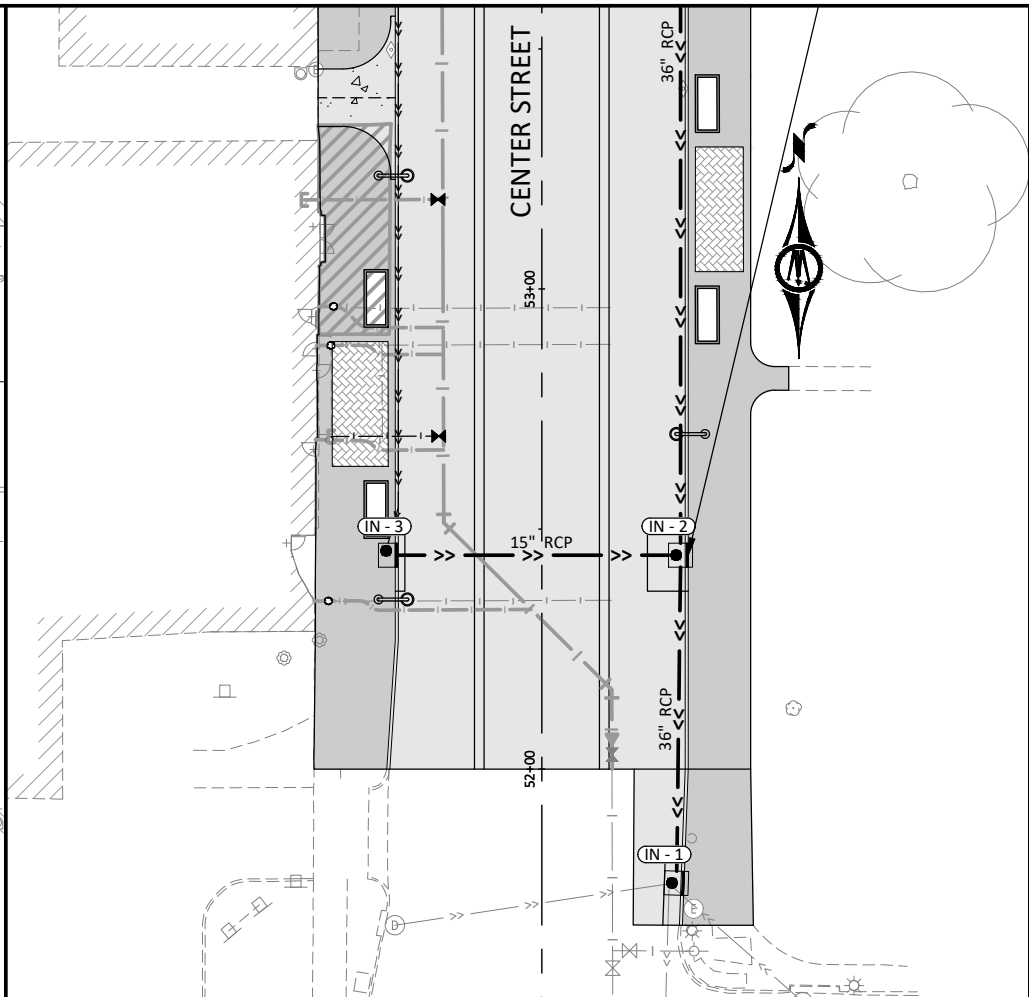
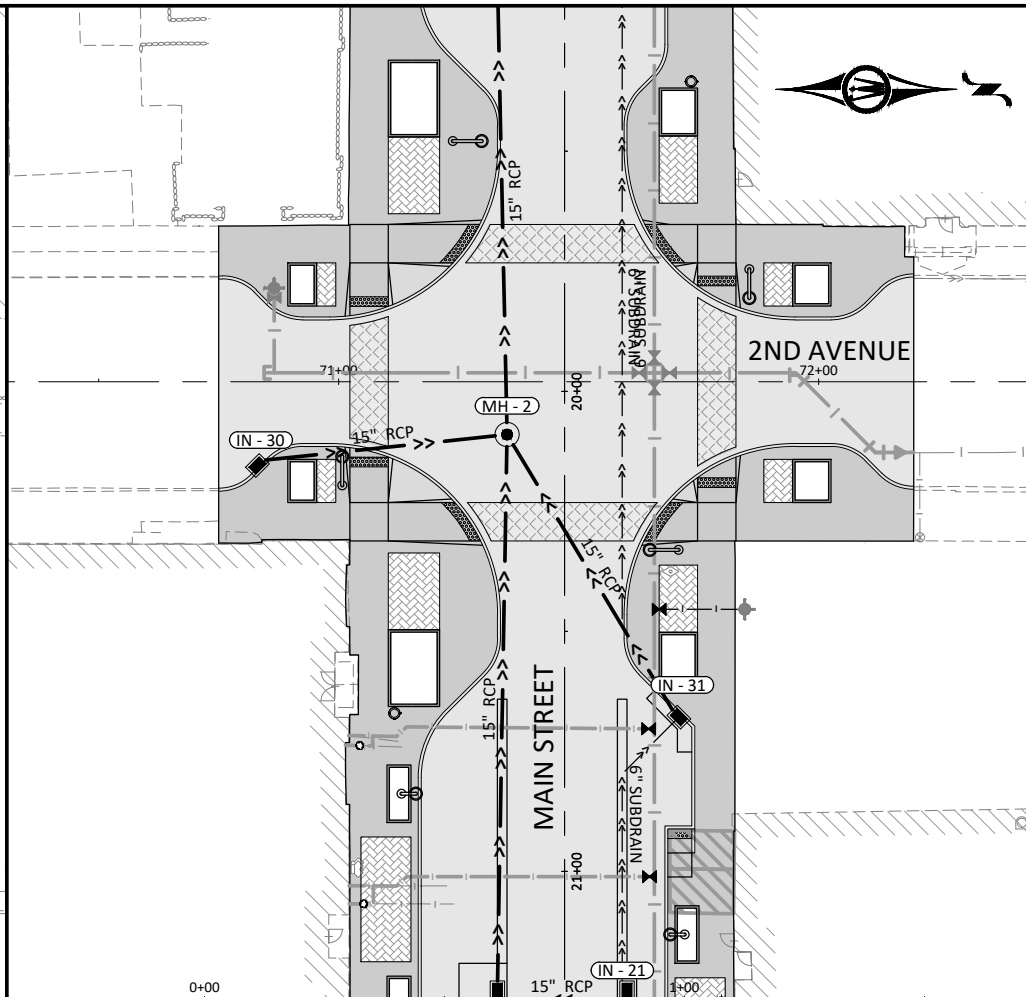
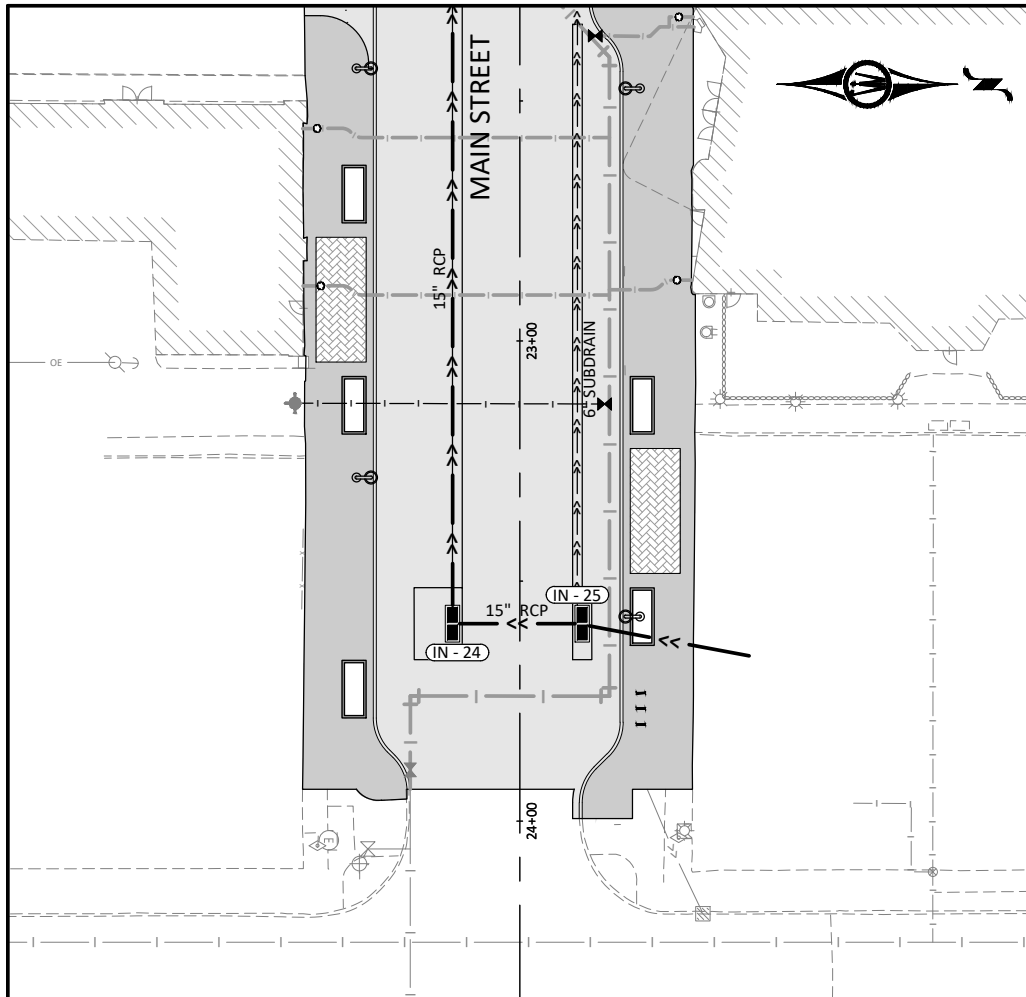
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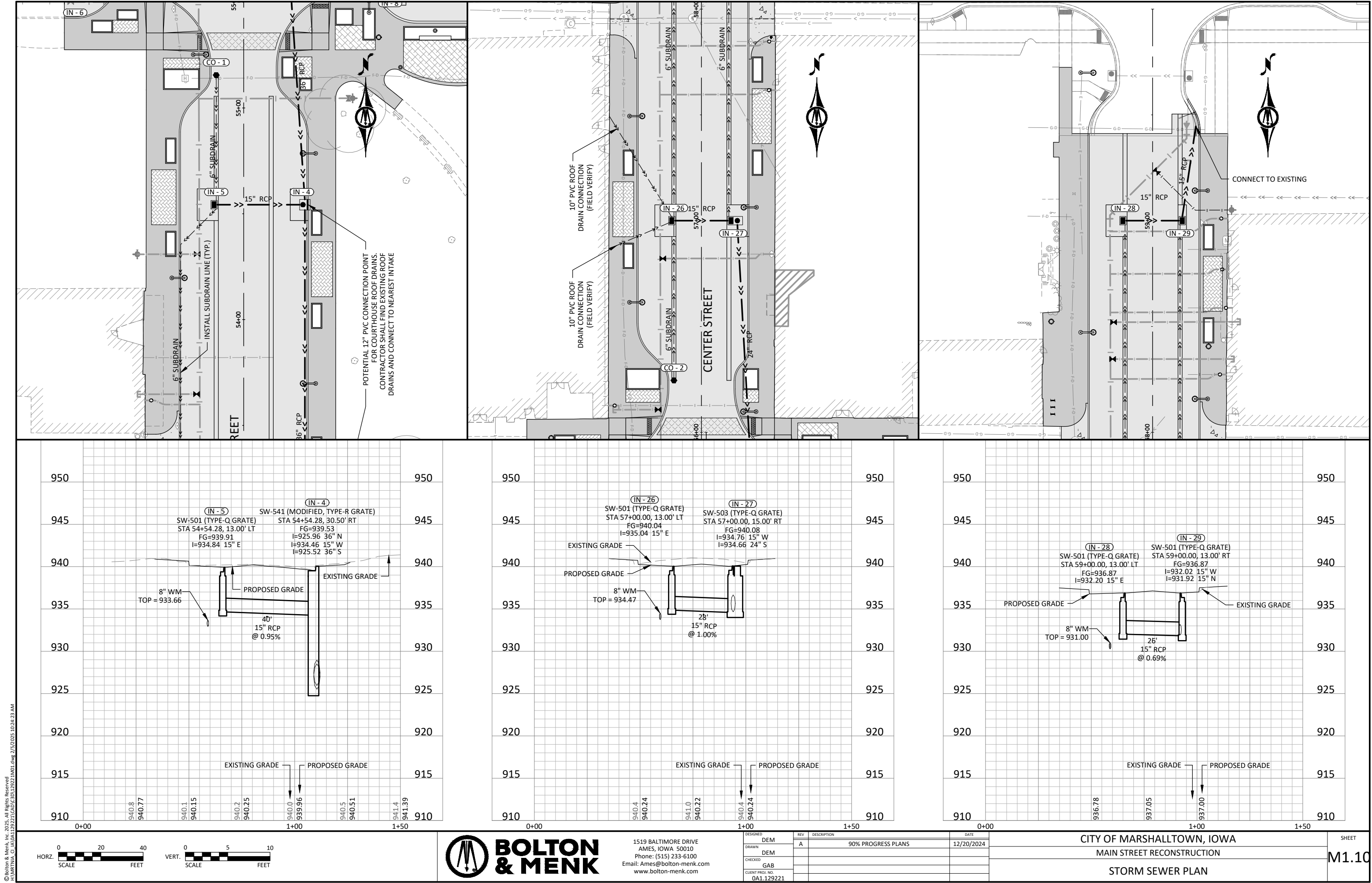


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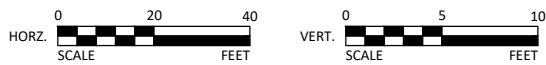
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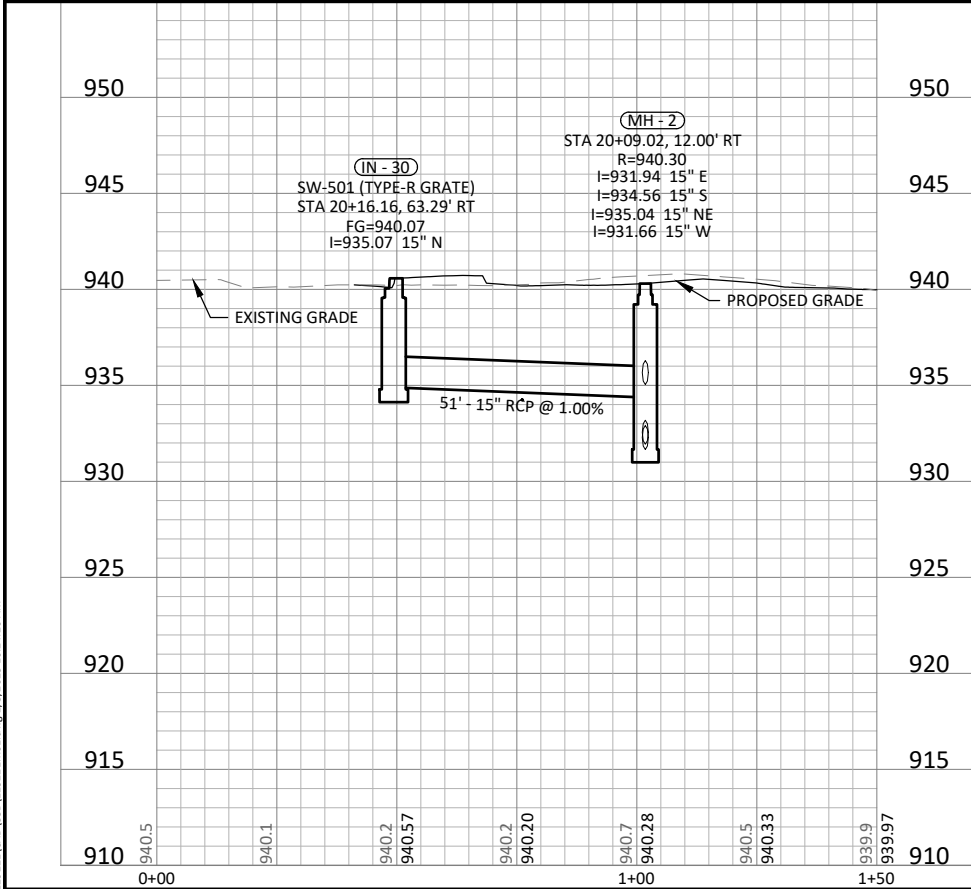
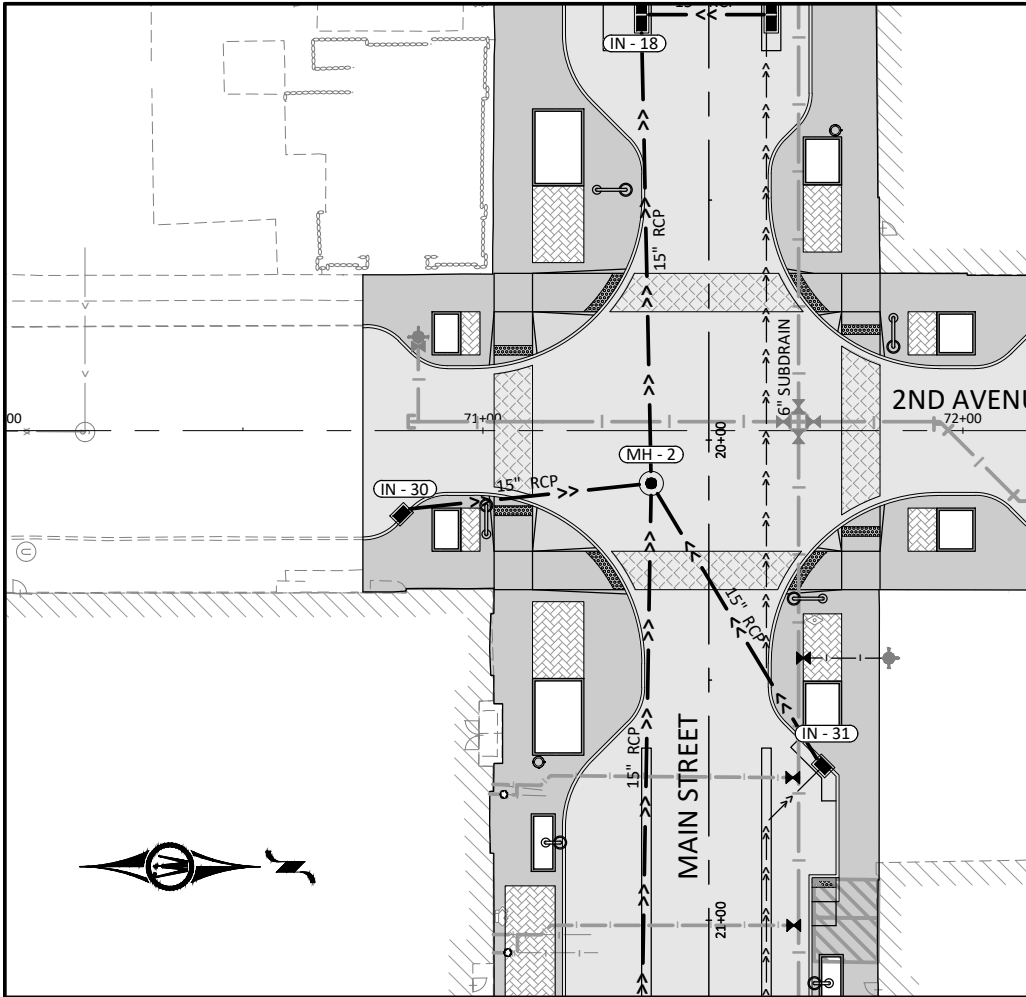


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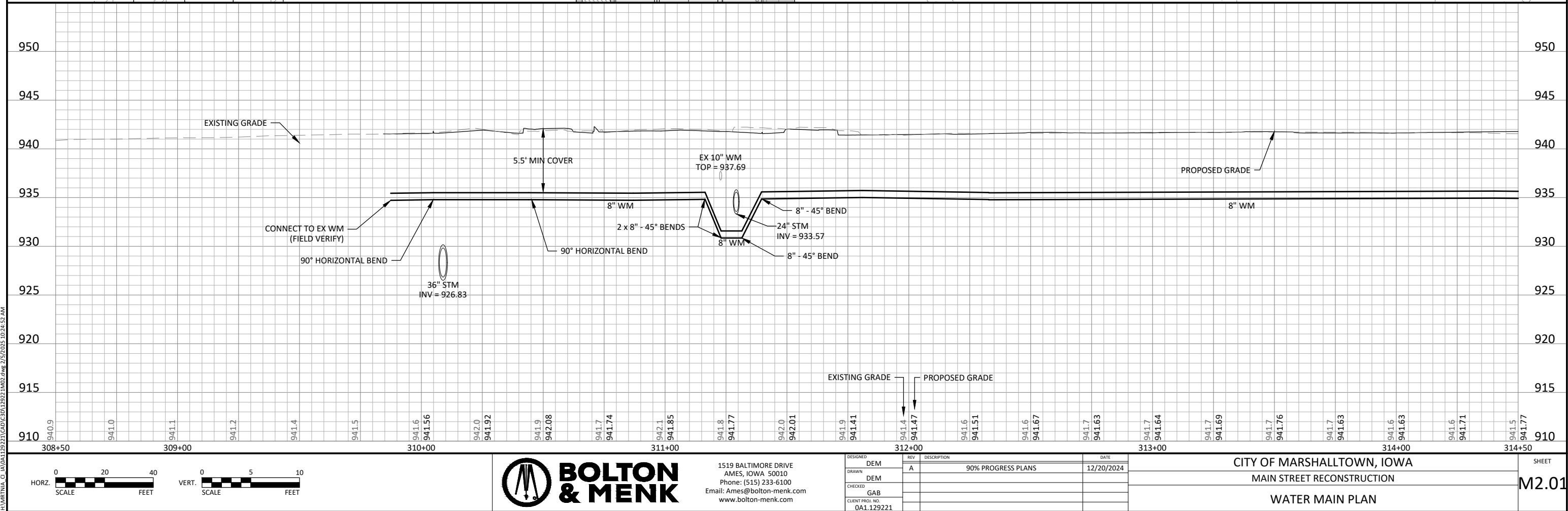
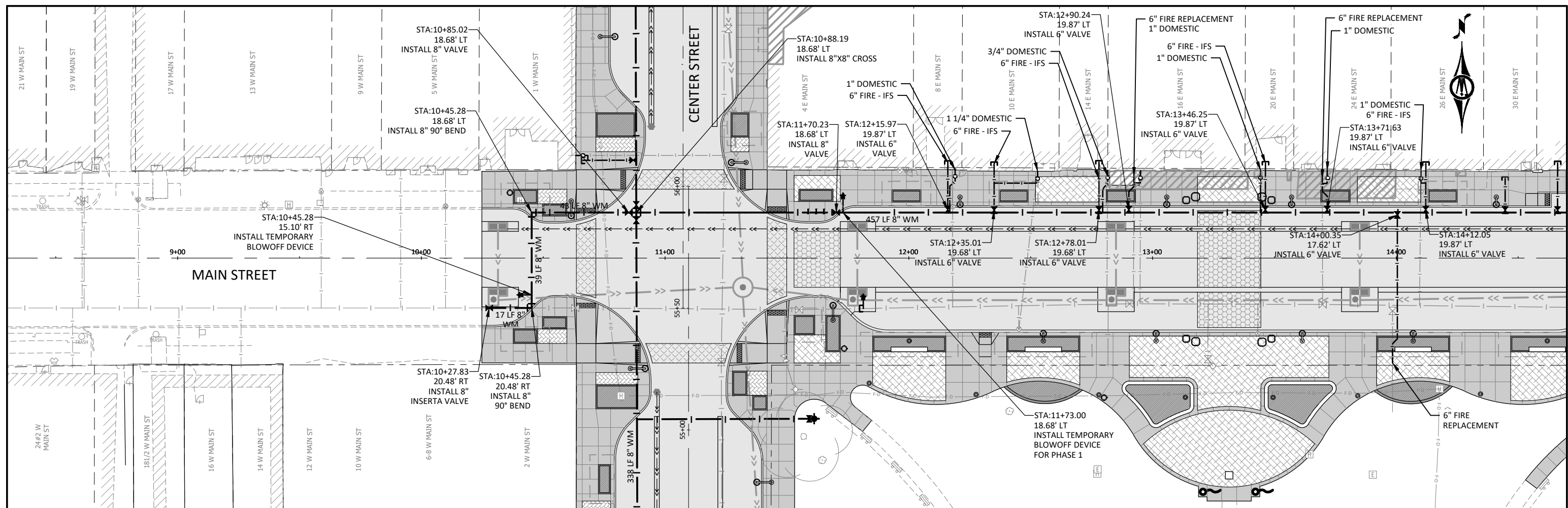
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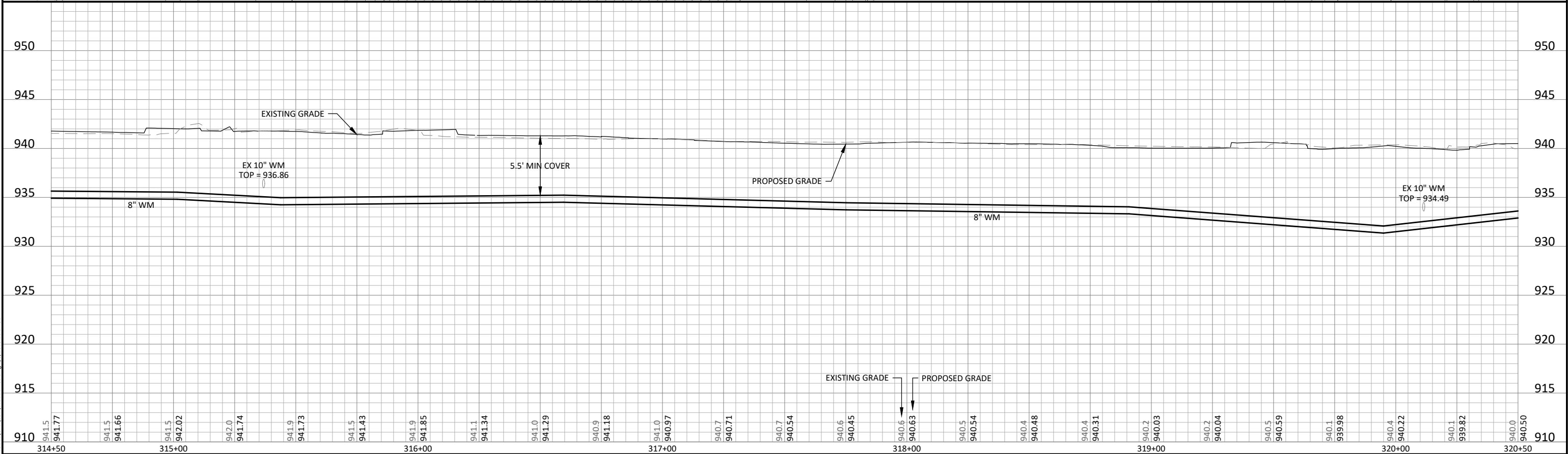
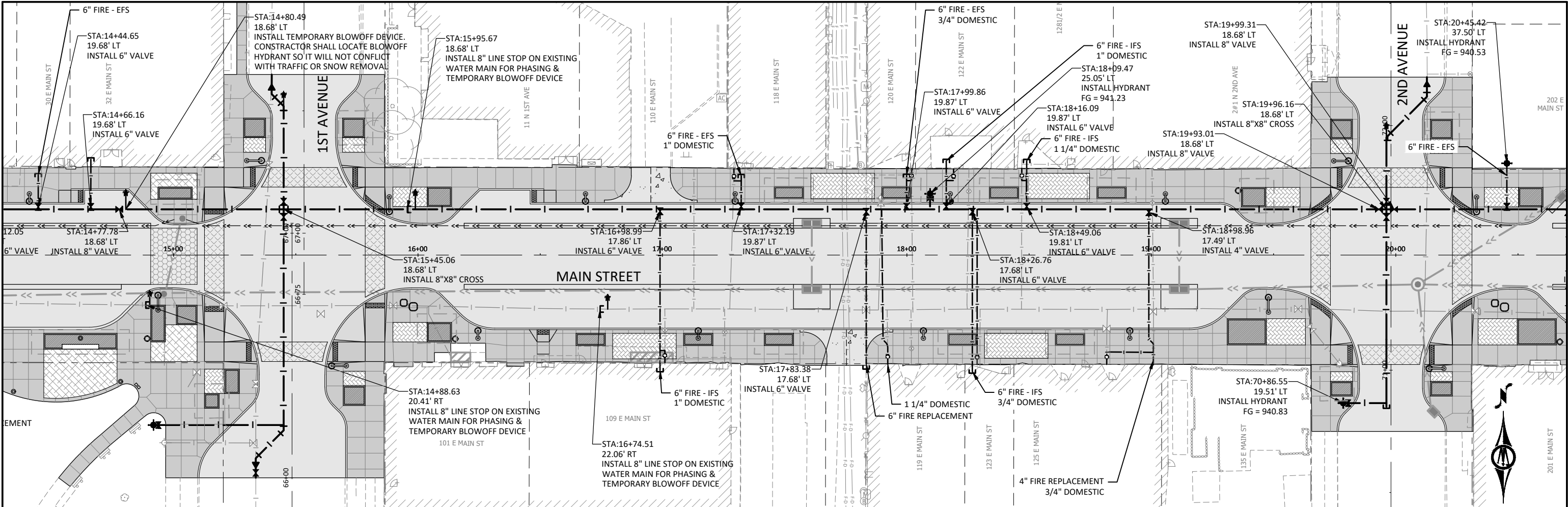
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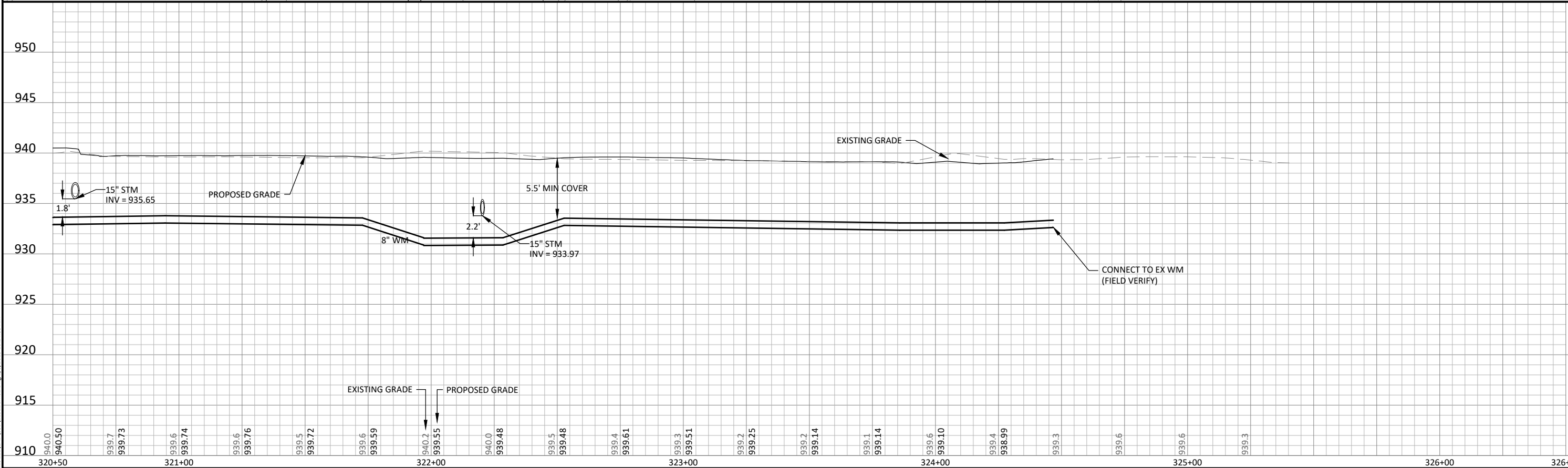
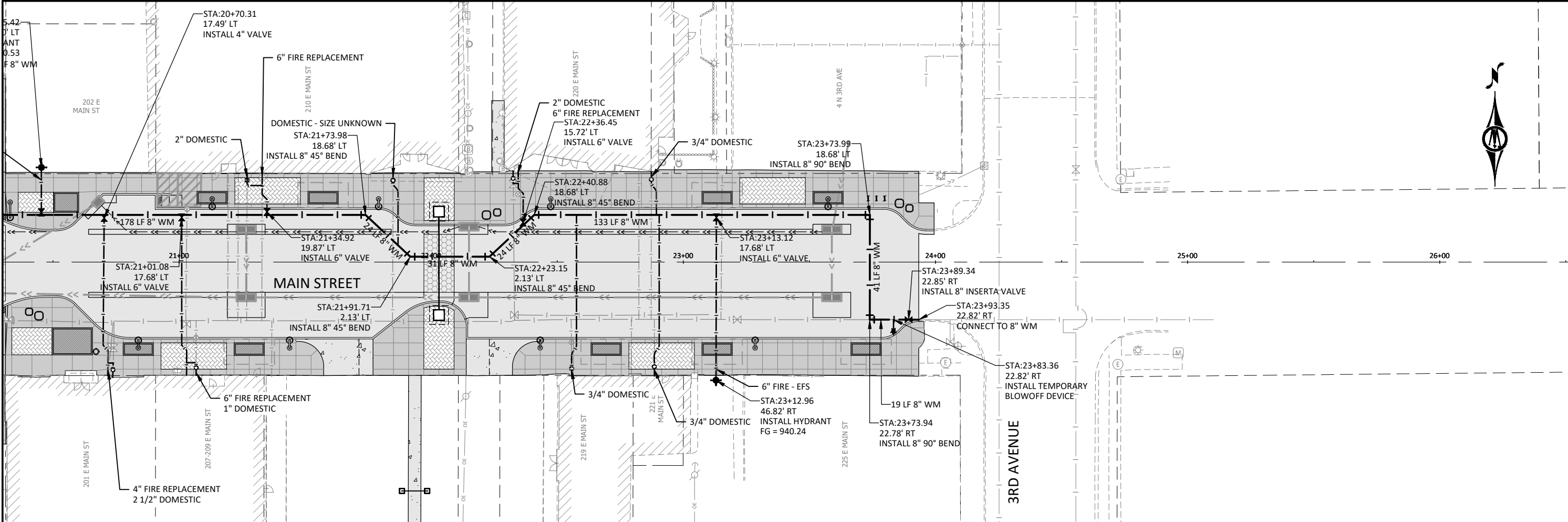
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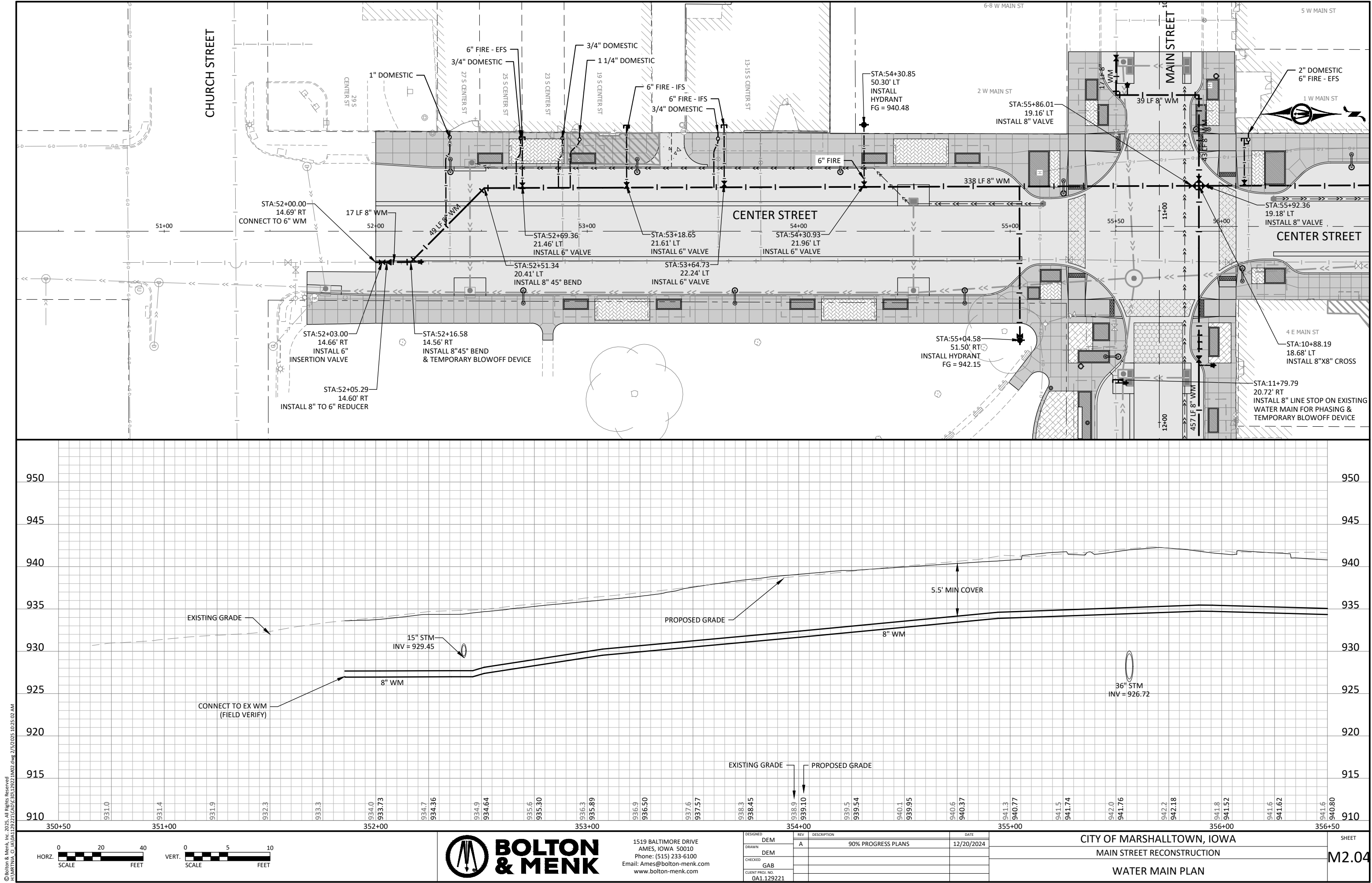
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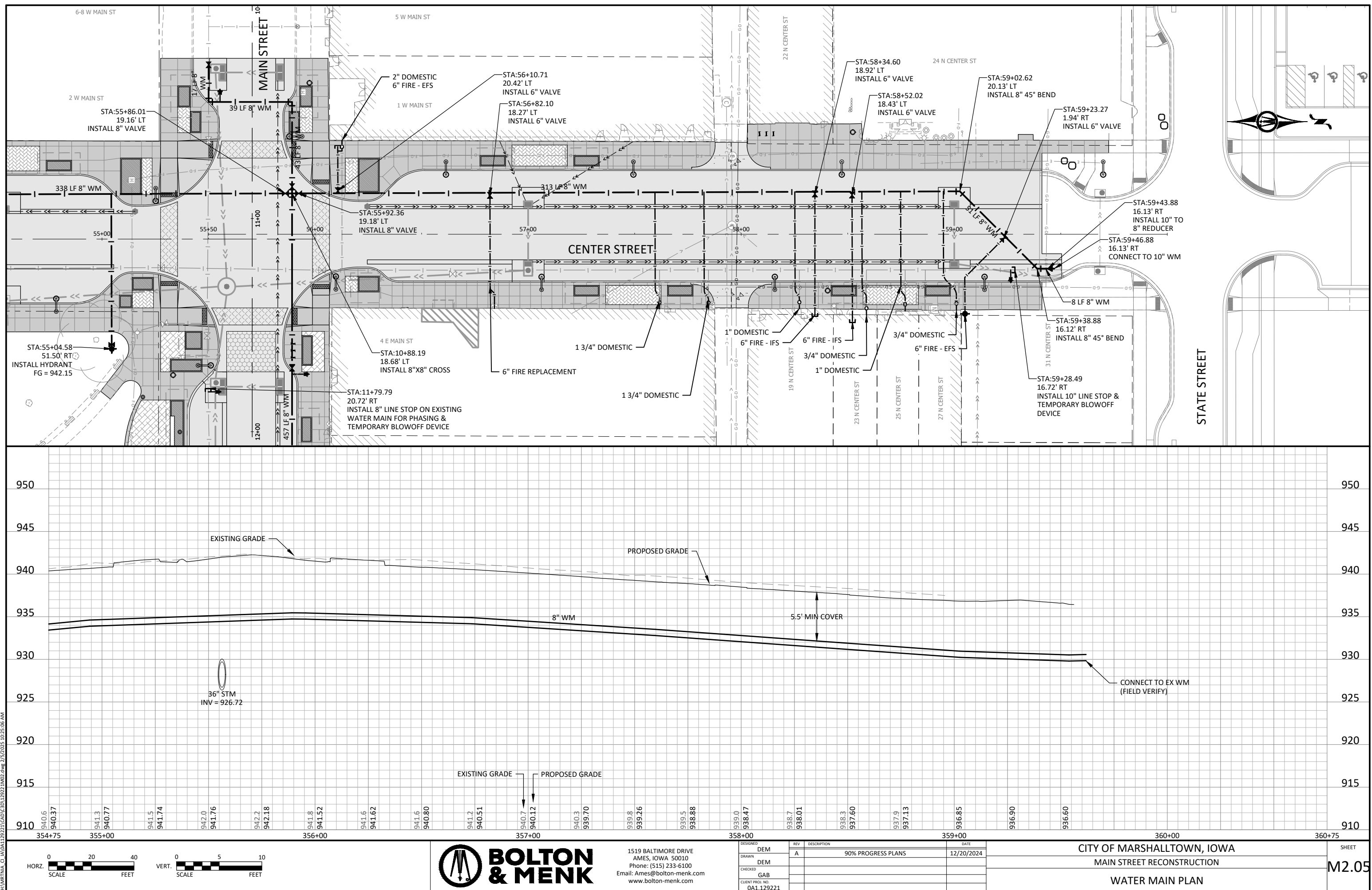


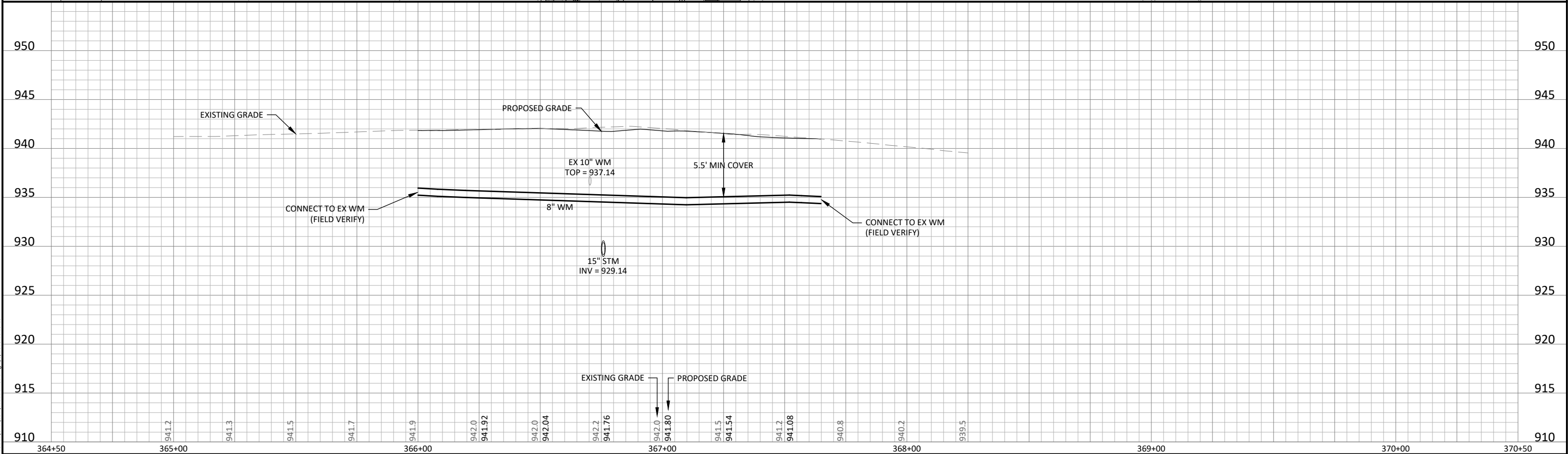
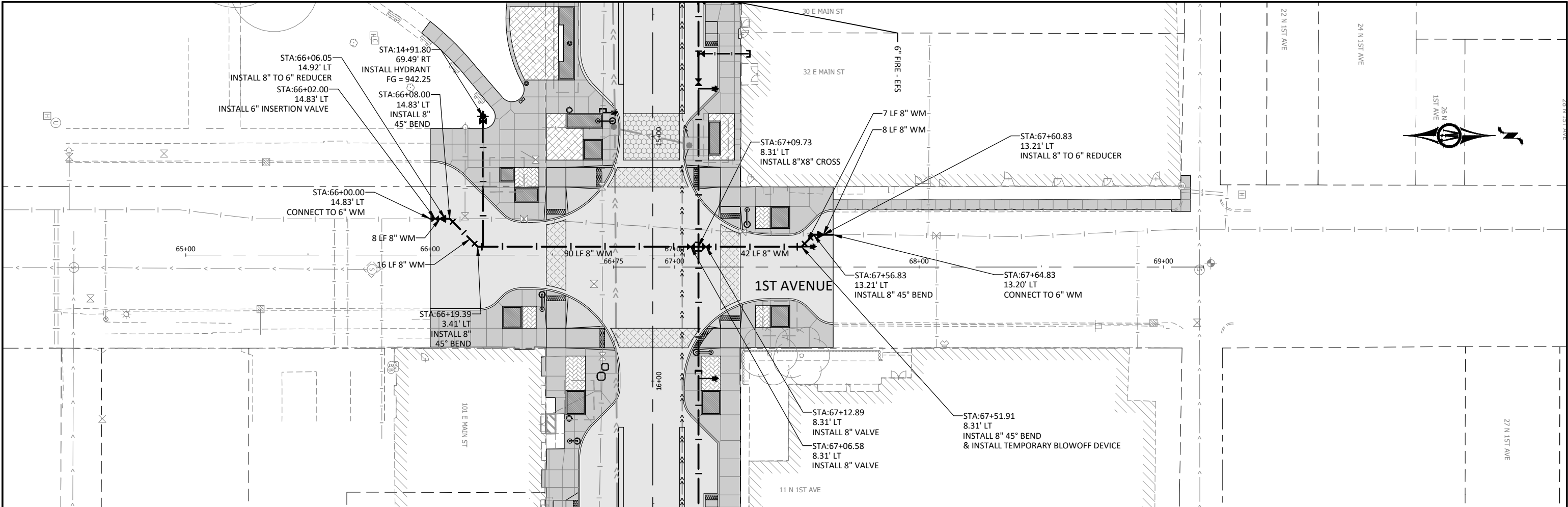
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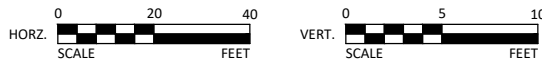
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MAIN STREET RECONSTRUCTION
WATER MAIN PLAN

SHEET
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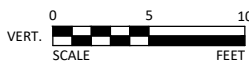
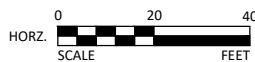
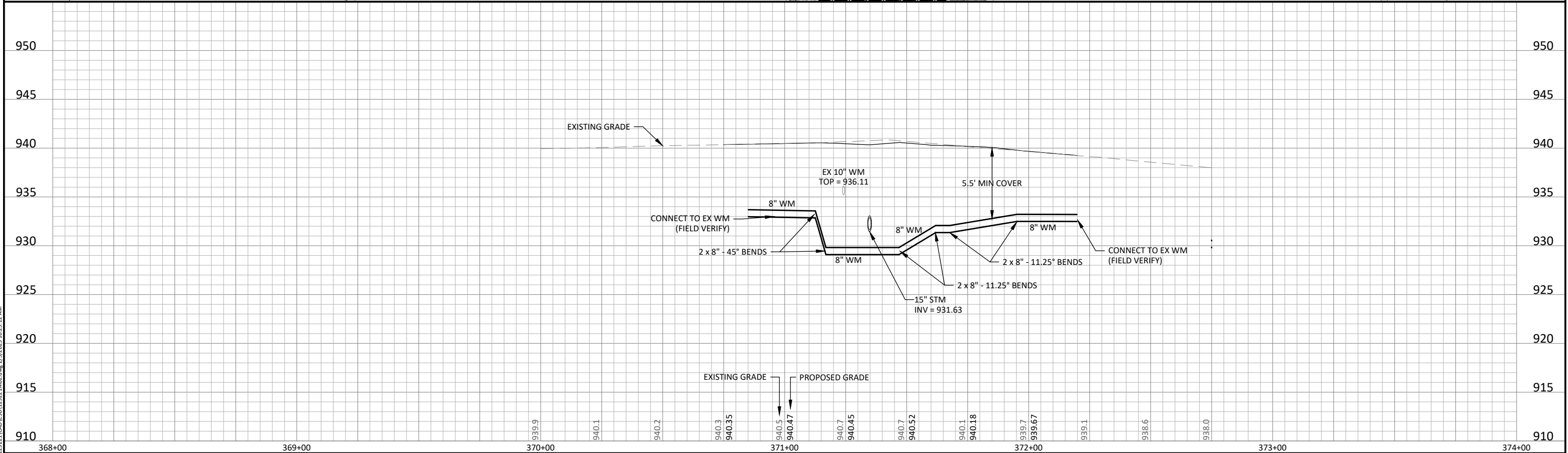
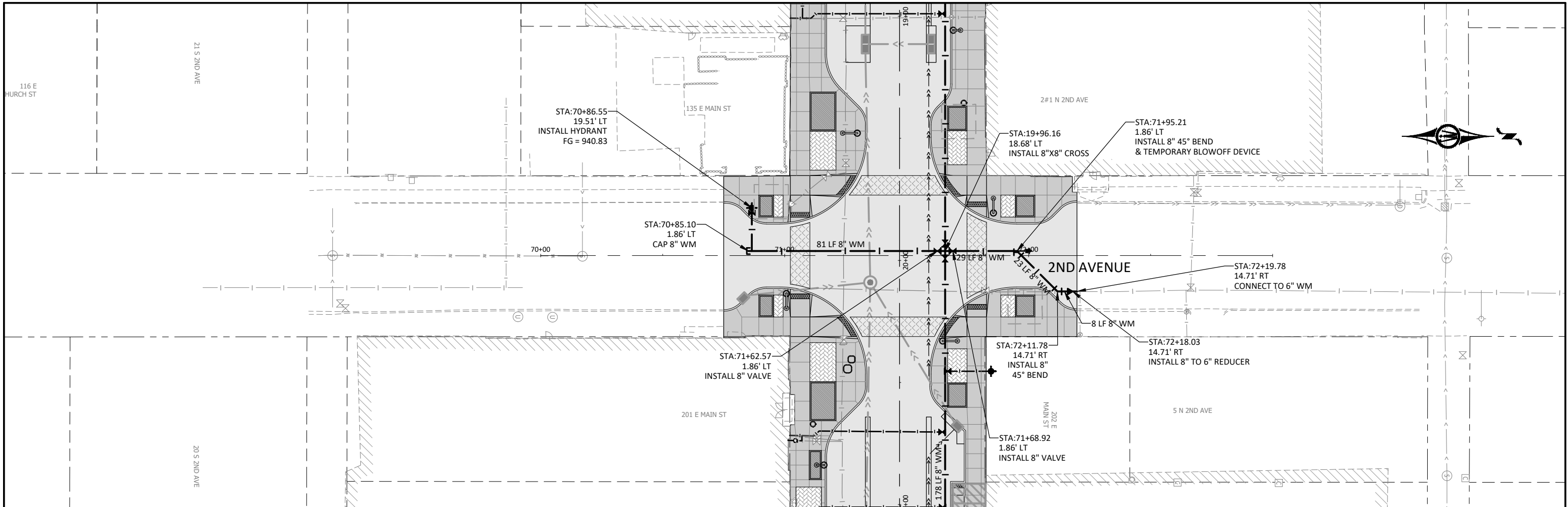
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MAIN STREET RECONSTRUCTION

WATER MAIN PLAN

SHEET
M2.06

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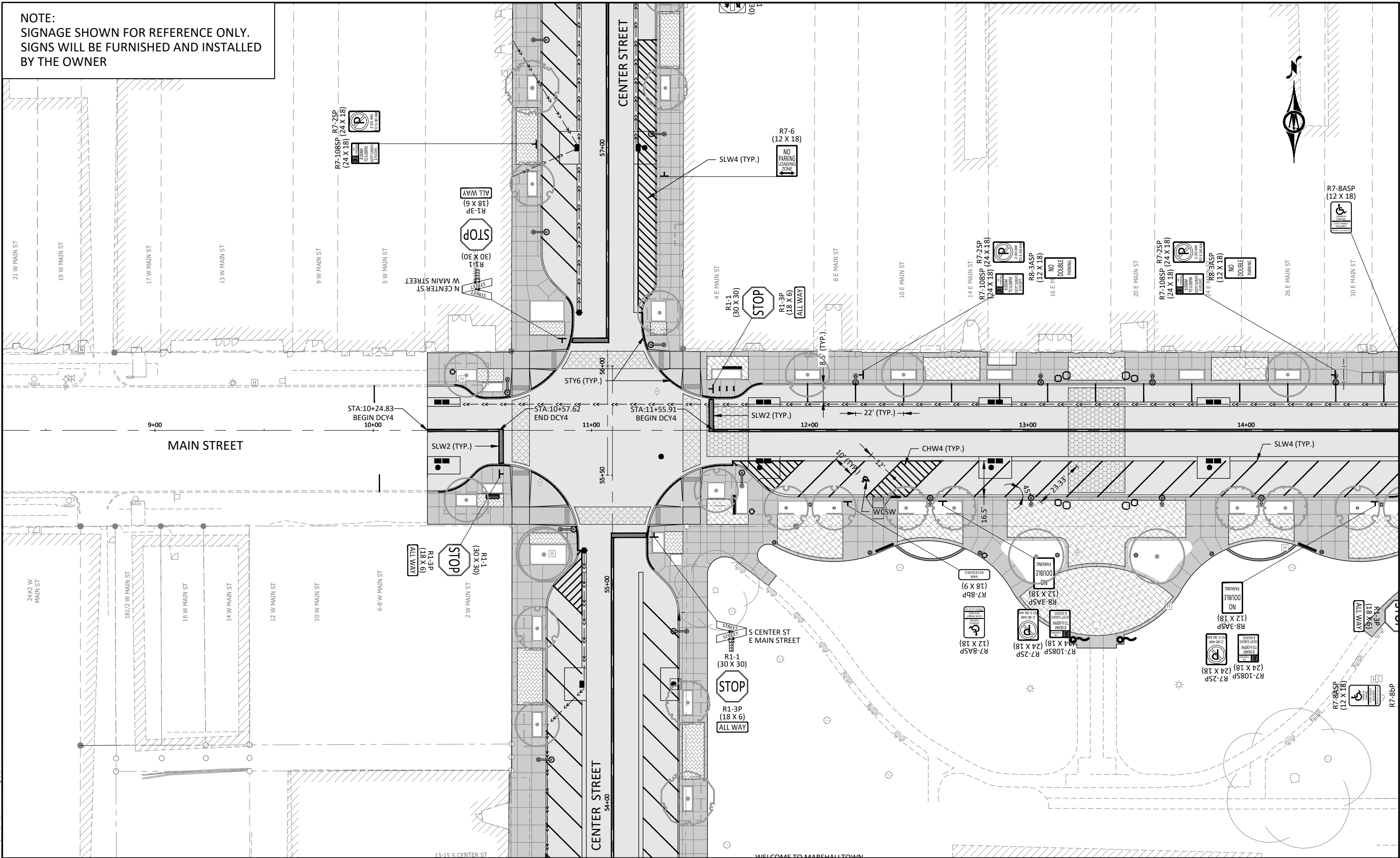
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WATER MAIN PLAN

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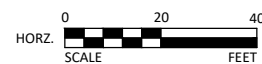
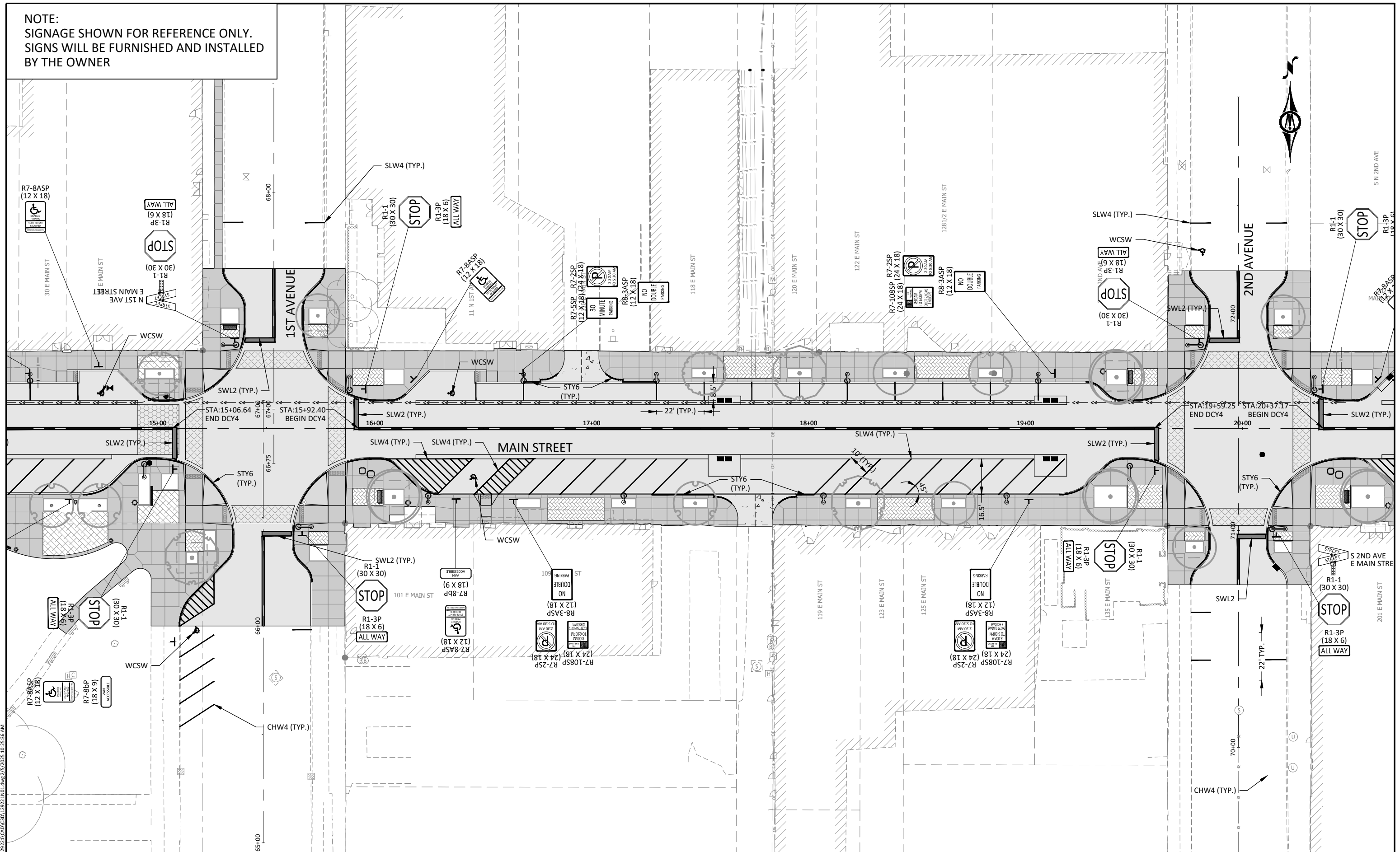
WELCOME TO MARSHALLTOWN

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PAVEMENT MARKING AND SIGNAGE PLAN

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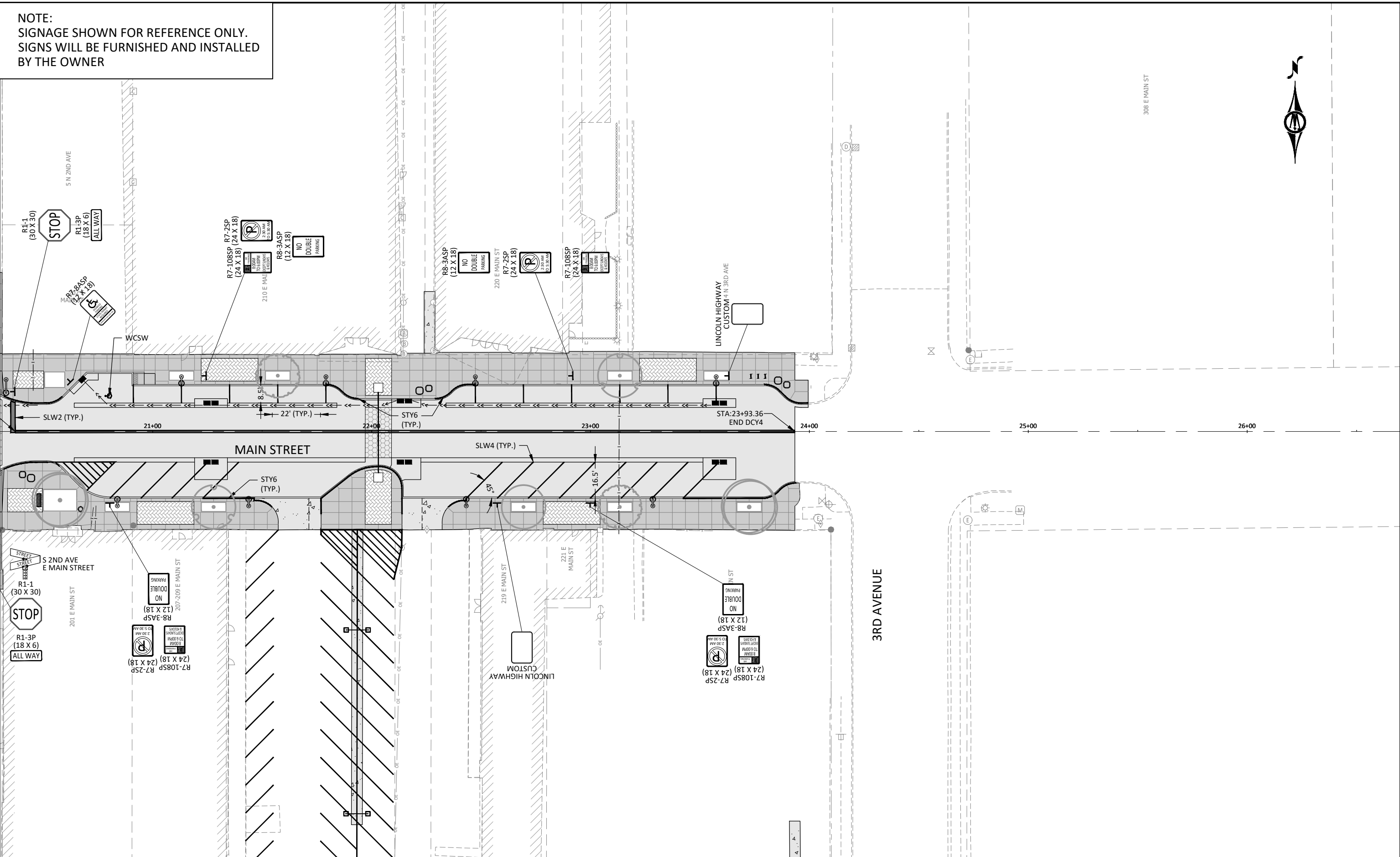
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MAIN STREET RECONSTRUCTION

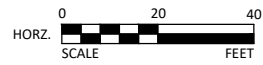
PAVEMENT MARKING AND SIGNAGE PLAN

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.02

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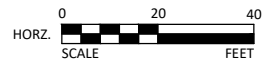
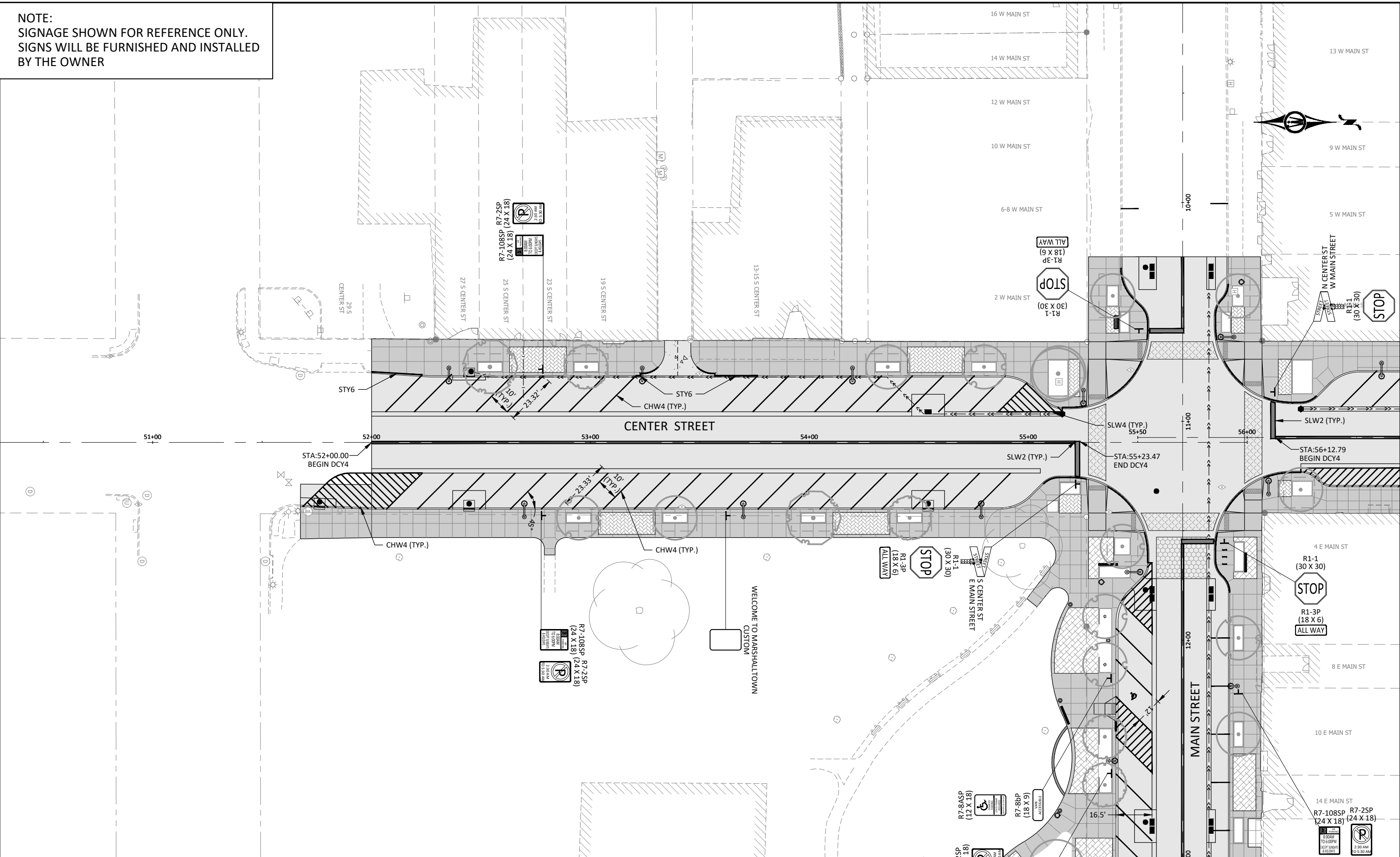
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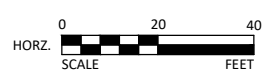
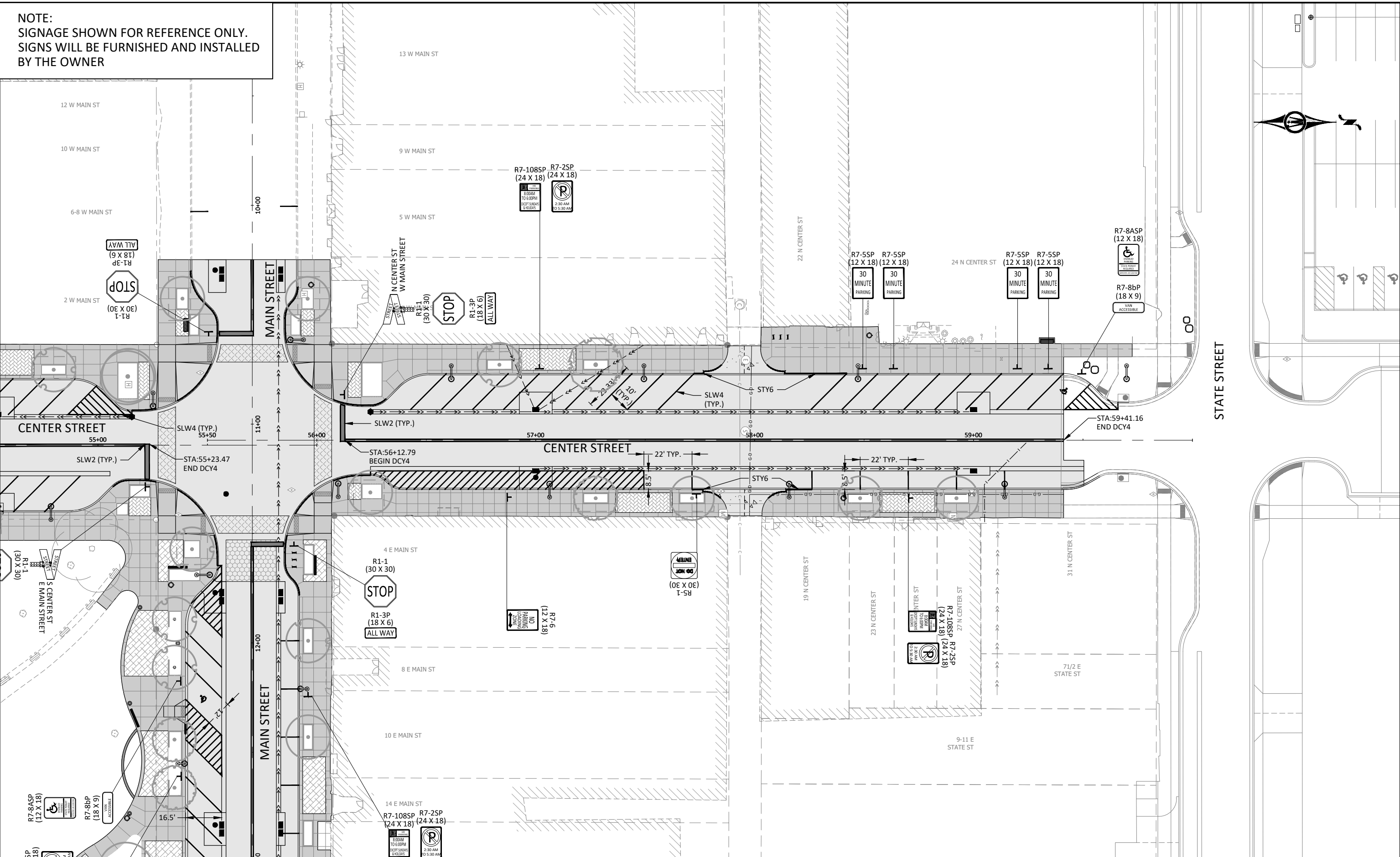
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PAVEMENT MARKING AND SIGNAGE PLAN

SHEET
N.04

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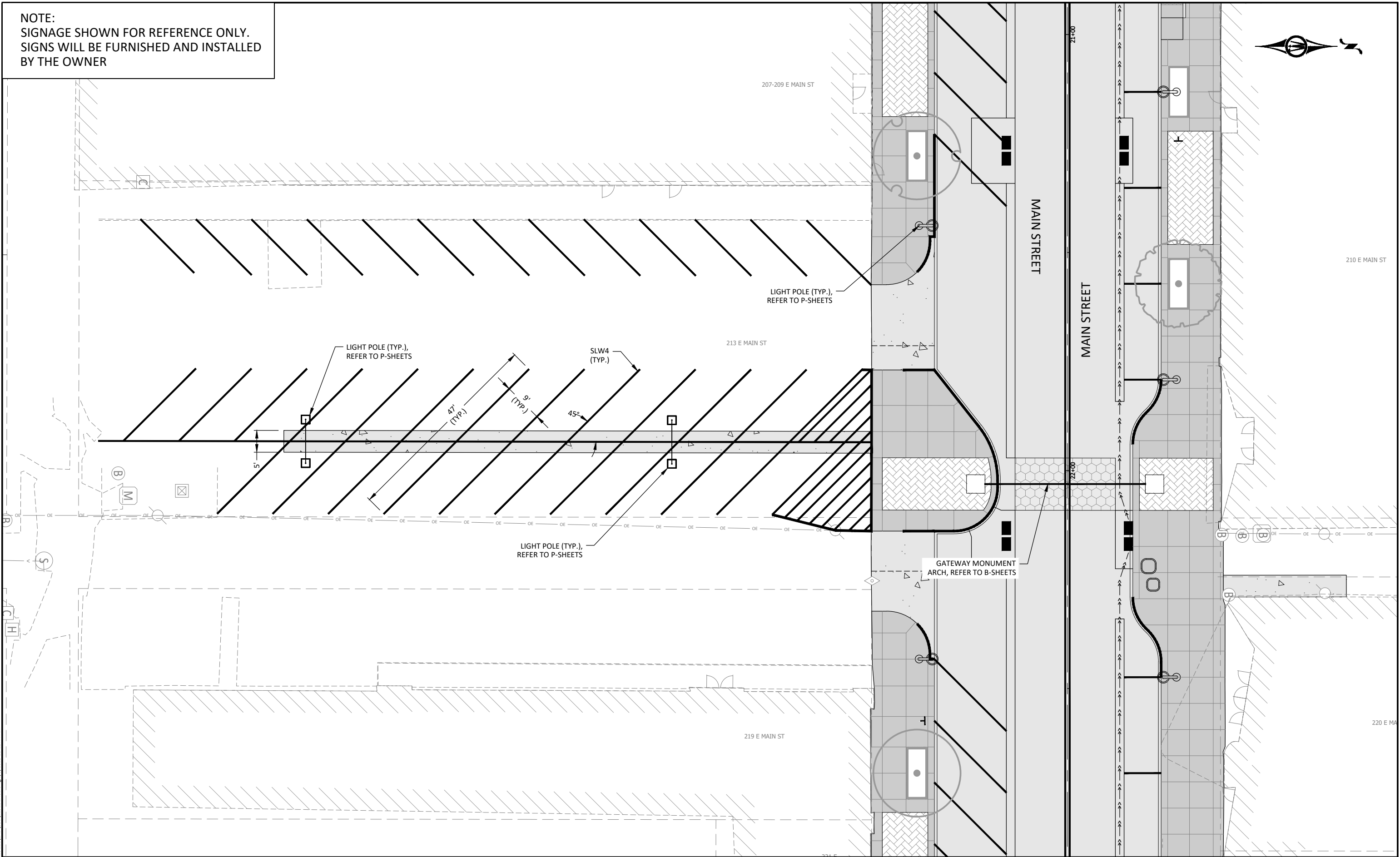
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PAVEMENT MARKING AND SIGNAGE PLAN

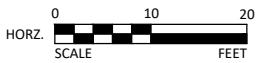
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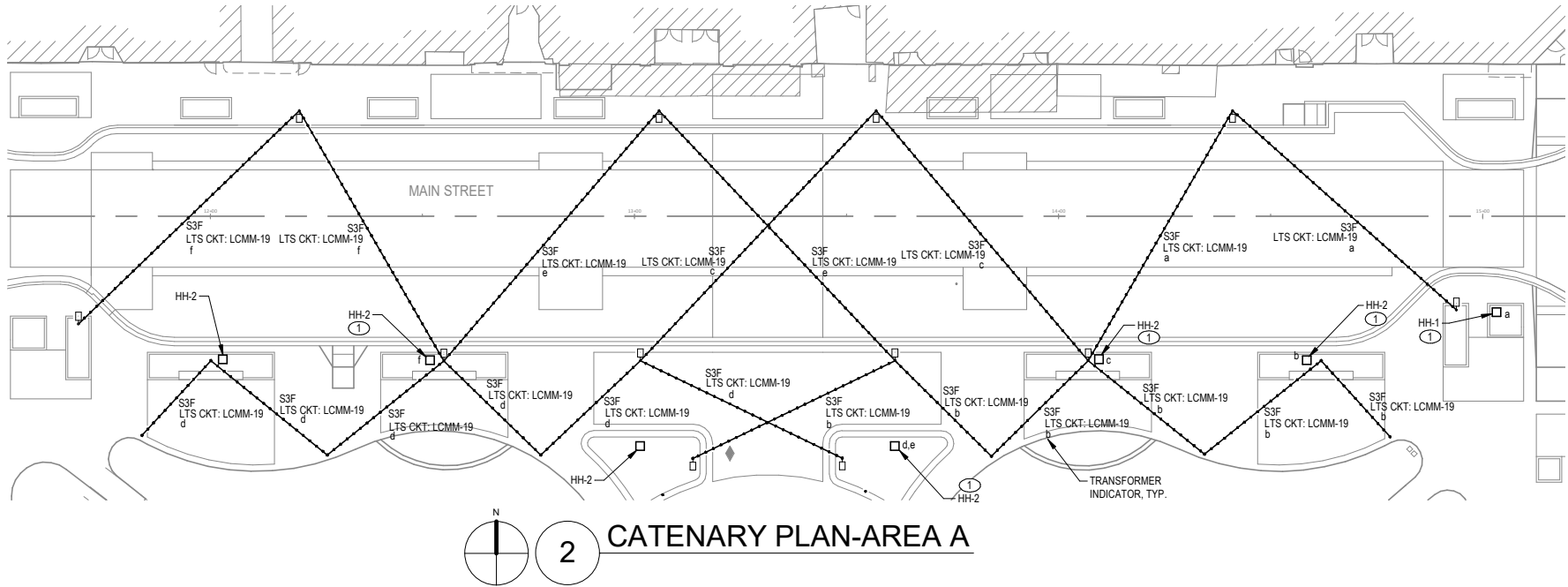
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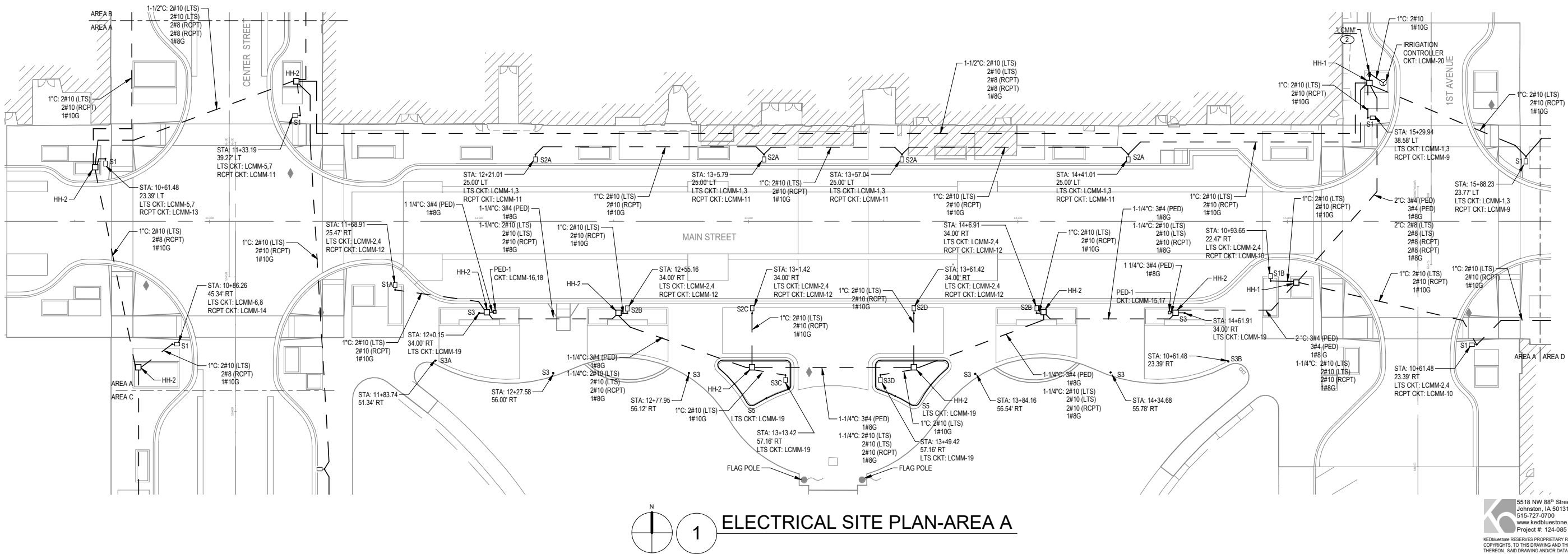
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MAIN STREET RECONSTRUCTION
PAVEMENT MARKING AND SIGNAGE PLAN

SHEET
N.06



- GENERAL NOTES:**
- REFER TO SHEET P.08 FOR LUMINAIRE SCHEDULE AND PANEL SCHEDULE.
 - REFER TO 2/P.06 FOR POLE BASE DETAIL, UNLESS OTHERWISE NOTED.
 - REFER TO 1/P.06 FOR HAND HOLE DETAIL.
 - COORDINATE UNDERGROUND CONDUIT ROUTING TO BE WITHIN REMOVED ROADSIDEWALK SURFACE WHERE POSSIBLE. COORDINATE ROUTING AND DEPTH WITH EXISTING UNDERGROUND UTILITIES. MINIMUM CONDUIT DEPTH OF 18".

- KEYED NOTES:**
- INSTALL NEMA 3R LOW VOLTAGE TRANSFORMER IN HAND HOLE FOR CATENARY LIGHTING. LETTER NEXT TO HANDHOLE INDICATES THE TRANSFORMER LOCATION FOR EACH RUN OF CATENARY LIGHTING.
 - INSTALL 2" SERVICE CONDUIT FROM 'LCMM' TO EXISTING LOCATION OF A SERVICE IN THE ALLEYWAY TO THE NORTH (180 FEET TO THE NORTH).



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HORIZ. SCALE FEET



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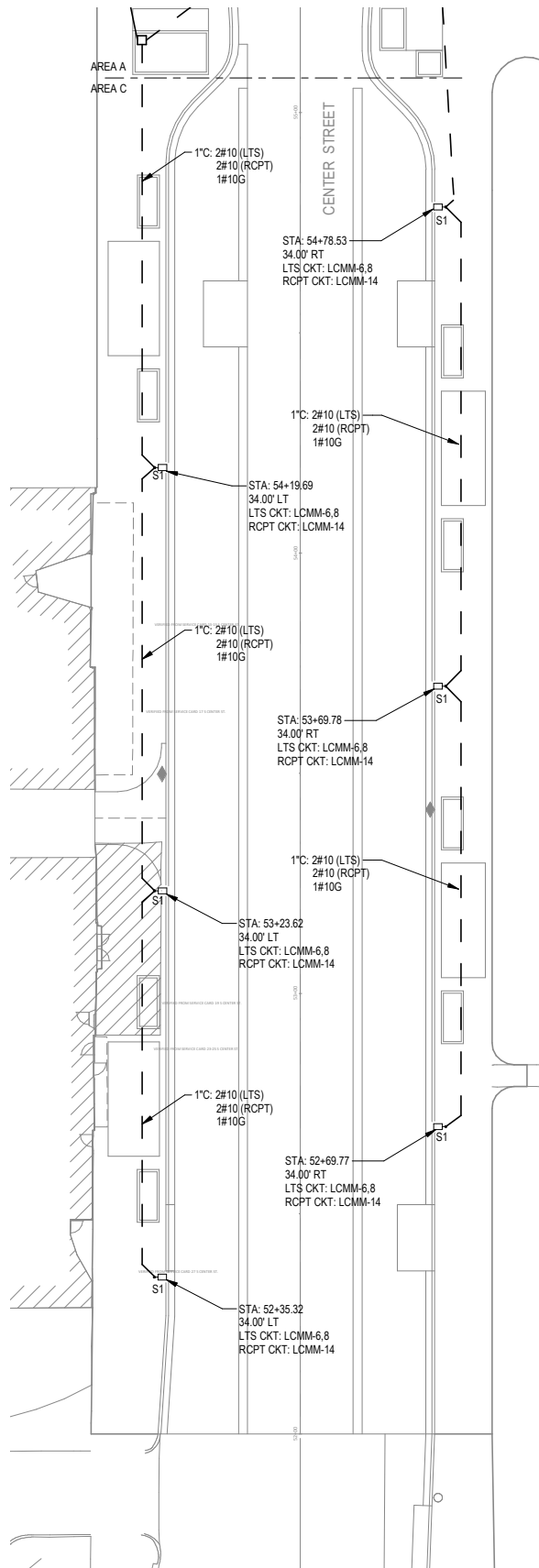
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MAIN STREET
ELECTRICAL SITE PLAN - AREA A

SHEET

P.02



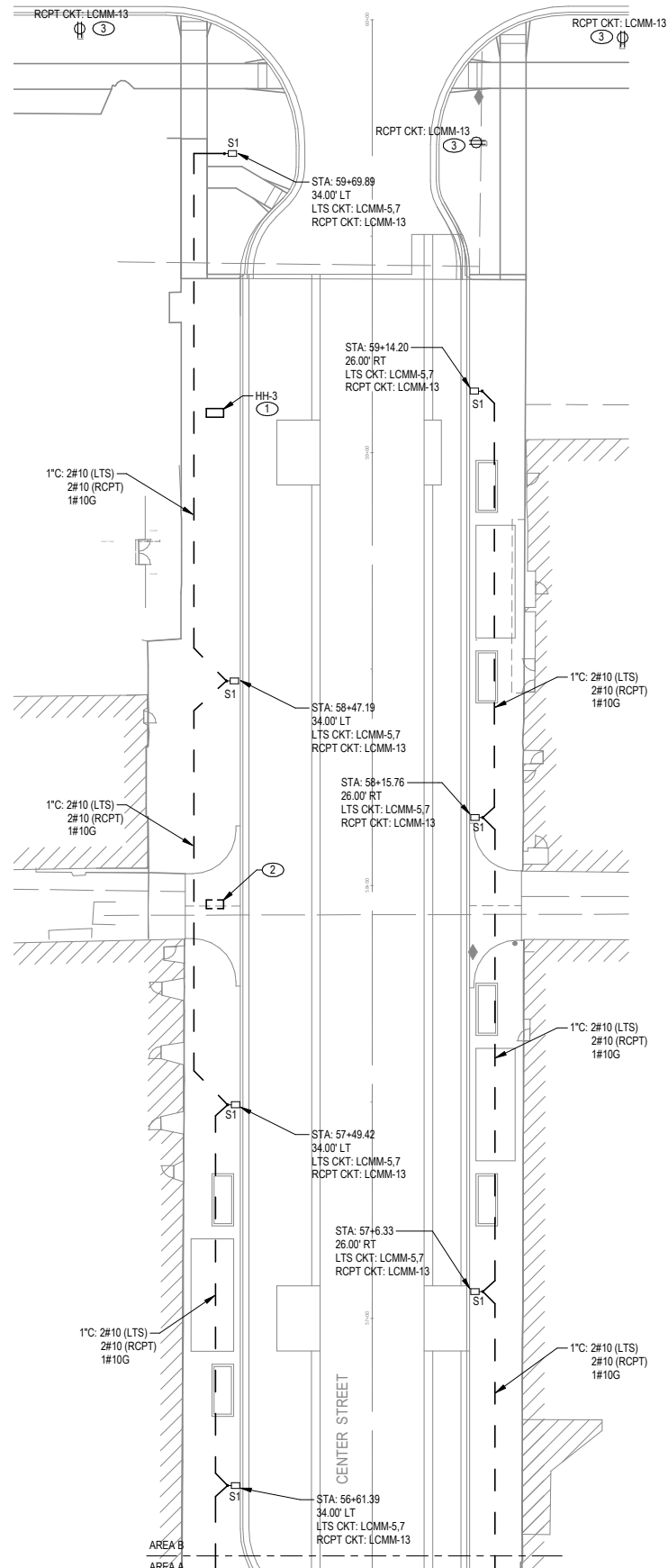
 **2** ELECTRICAL SITE PLAN-AREA C

HORZ.  SCALE FEET



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 **1** ELECTRICAL SITE PLAN-AREA B

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MAIN STREET
ELECTRICAL SITE PLAN - AREA B & C

SHEET

P.03

GENERAL NOTES:

- REFER TO SHEET P.08 FOR LUMINAIRE SCHEDULE AND PANEL SCHEDULE.
- REFER TO 2/P.06 FOR POLE BASE DETAIL, UNLESS OTHERWISE NOTED.
- REFER TO 1/P.06 FOR HAND HOLE DETAIL.
- COORDINATE UNDERGROUND CONDUIT ROUTING TO BE WITHIN REMOVED ROAD/SIDEWALK SURFACE WHERE POSSIBLE. COORDINATE ROUTING AND DEPTH WITH EXISTING UNDERGROUND UTILITIES. MINIMUM CONDUIT DEPTH OF 18".

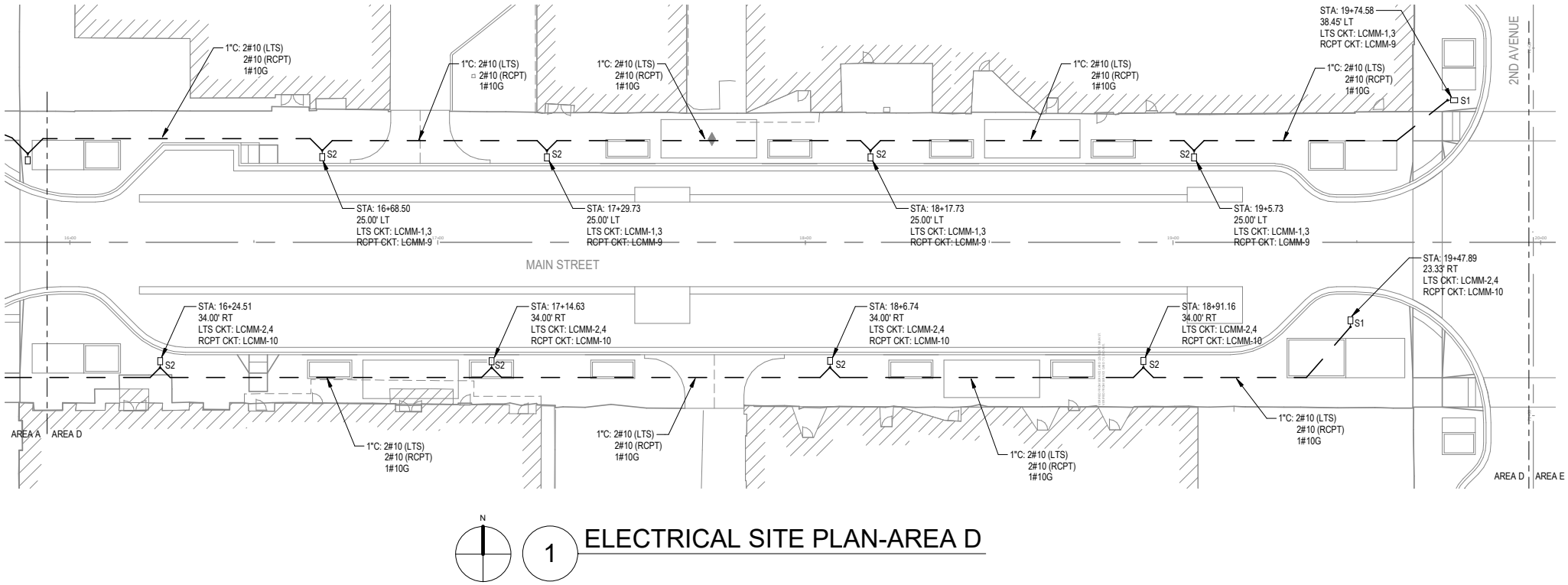
KEYED NOTES:

- REMOVE EXISTING HAND HOLE AND REPLACE IT WITH NEW HAND HOLE.
- REMOVE EXISTING HAND HOLE AND INSTALL IPEX EPR CONDUIT REPAIR KIT (OR APPROVED EQUAL) AROUND EXISTING FIBER TO CONNECT THE EXISTING CONDUIT. EC TO FIELD VERIFY CONDUIT SIZE PRIOR TO ORDERING.
- INTERCEPT EXISTING RECEPTACLE CIRCUIT TO REFEED EXISTING RECEPTACLES.

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- GENERAL NOTES:**
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 2. REFER TO 2/P.06 FOR POLE BASE DETAIL. UNLESS OTHERWISE NOTED.
 3. REFER TO 1/P.06 FOR HAND HOLE DETAIL.
 4. COORDINATE UNDERGROUND CONDUIT ROUTING TO BE WITHIN REMOVED ROADSIDEWALK SURFACE WHERE POSSIBLE. COORDINATE ROUTING AND DEPTH WITH EXISTING UNDERGROUND UTILITIES. MINIMUM CONDUIT DEPTH OF 18".



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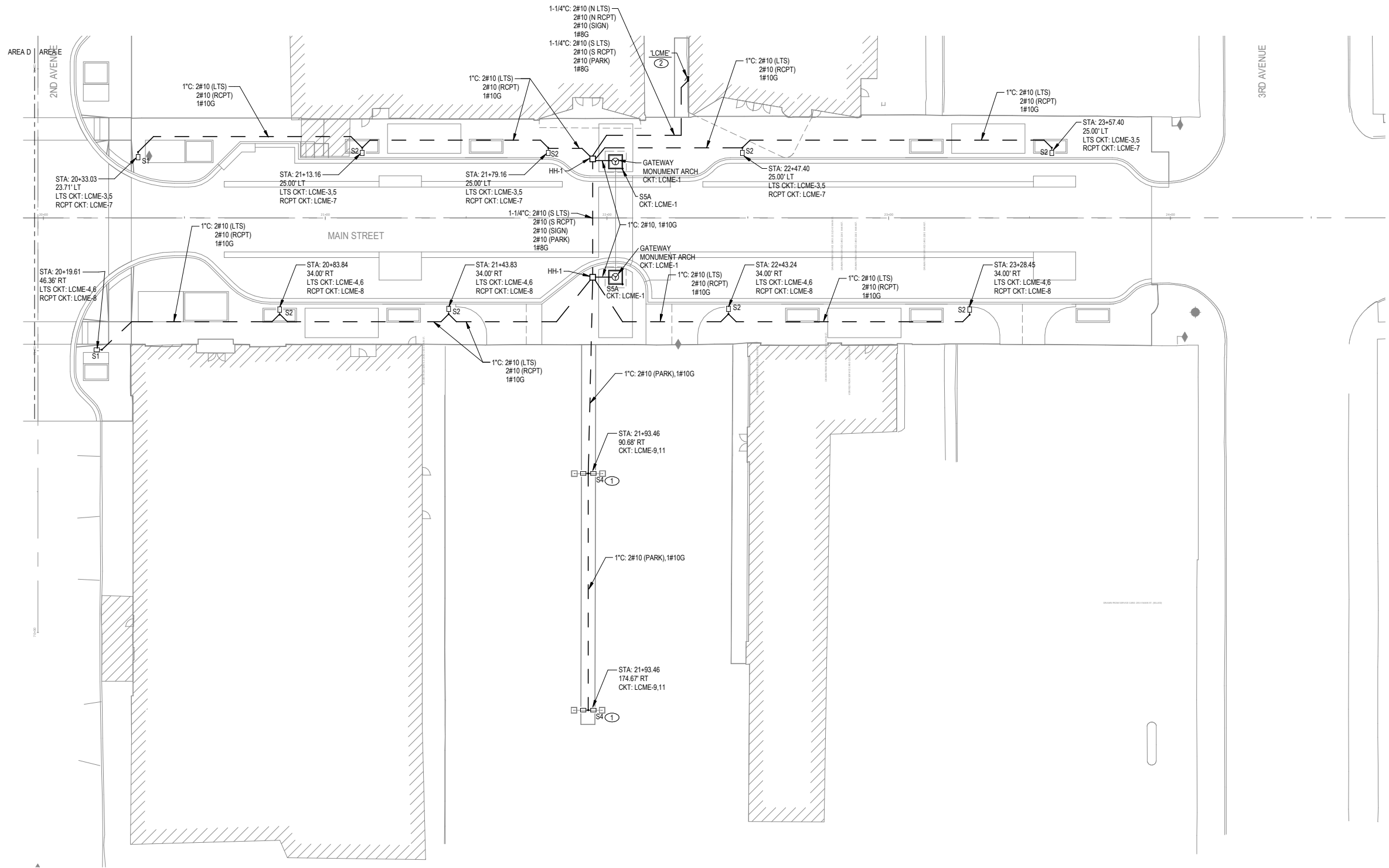
CITY OF MARSHALLTOWN, IOWA
MAIN STREET
ELECTRICAL SITE PLAN - AREA D

SHEET

P.04

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 - REFER TO 2/P.06 FOR POLE BASE DETAIL. UNLESS OTHERWISE NOTED.
 - REFER TO 1/P.06 FOR HAND HOLE DETAIL.
 - COORDINATE UNDERGROUND CONDUIT ROUTING TO BE WITHIN REMOVED ROADSIDE/WALK SURFACE WHERE POSSIBLE. COORDINATE ROUTING AND DEPTH WITH EXISTING UNDERGROUND UTILITIES. MINIMUM CONDUIT DEPTH OF 18".

- KEYED NOTES:**
- POLE TO BE INSTALLED ON AN EXTENDED BASE. REFER TO 3/P.06 FOR POLE BASE DETAIL.
 - REMOVE EXISTING ELECTRICAL PANEL AND CONTROLS AND INSTALL NEW WALL MOUNTED CONTROL CABINET.

1 ELECTRICAL SITE PLAN-AREA E

0 20 40
HORIZ. SCALE FEET



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ELECTRICAL SITE PLAN - AREA E

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1. REINFORCING SHALL BE (8) #4 VERTICAL BARS AND #4 "S" BARS AT 12" MAX SPACES. MAINTAIN 3" CLEARANCE BETWEEN STEEL AND EDGE OF CONCRETE.



1. REINFORCING SHALL BE (8) #4 VERTICAL BARS AND #4 "S" BARS AT 12" MAX SPACES. MAINTAIN 3" CLEARANCE BETWEEN STEEL AND EDGE OF CONCRETE.



NOTES:

1. REFER TO SITE PLAN FOR SIZE OF HANDHOLE.



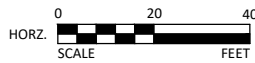
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LUMINAIRE SCHEDULE												
TYPE	DESCRIPTION	MANUFACTURER/MODEL	FINISHES	LIGHT SOURCE	MOUNTING	DELIVERED LUMENS	CRI	CCT	DIMMING	DISTRIBUTION	WATTS	VOLTAGE
S1	SINGLE-HEAD AREA LIGHT, FLAT LENS, AC4 ARM AT 22° 90 DEGREES, 24" BANNERS ARMS AT 15° AND 11° 90 DEGREES, WREATH BRACKETS AT 13.5° AND 12.5° 270 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, DECORATIVE BASE COVER	LUMEC DMS55/RS856V	BLACK	LED	22' POLE	9000	70	4000K	-	TYPE III	72 VA	240
S1A	SINGLE-HEAD AREA LIGHT, FLAT LENS, AC4 ARM AT 22° 90 DEGREES, 24" BANNERS ARMS AT 11° AND 15° 90 DEGREES, WREATH BRACKETS AT 12.5° AND 13.5° 270 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, EYELET AT 20° 45 DEGREES, DECORATIVE BASE COVER	LUMEC DMS55/RS856V	BLACK	LED	22' POLE	9000	70	4000K	-	TYPE III	72 VA	240
S1B	SINGLE-HEAD AREA LIGHT, FLAT LENS, AC4 ARM AT 22° 90 DEGREES, 24" BANNERS ARMS AT 11° AND 15° 90 DEGREES, WREATH BRACKETS AT 12.5° AND 13.5° 270 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, EYELET AT 20° 135 DEGREES, DECORATIVE BASE COVER	LUMEC DMS55/RS856V	BLACK	LED	22' POLE	9000	70	4000K	-	TYPE III	72 VA	240
S2	SINGLE-HEAD AREA LIGHT, FLAT LENS, AC4 ARM AT 18° 90 DEGREES, 24" BANNERS ARMS AT 11° AND 15° 90 DEGREES, WREATH BRACKETS AT 12.5° AND 13.5° 270 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, DECORATIVE BASE COVER	LUMEC DMS50/RS805J	BLACK	LED	18' POLE	7400	70	4000K	-	TYPE II	54 VA	240
S2A	SINGLE-HEAD AREA LIGHT, FLAT LENS, EWL-4" ARM AT 18° 90 DEGREES, 24" BANNERS ARMS AT 11° AND 15° 90 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, EYELETS AT 20° 45 AND 135 DEGREES, DECORATIVE BASE COVER	LUMEC DMS50/RS856V	BLACK	LED	22' POLE	7400	70	4000K	-	TYPE II	54 VA	240
S2B	SINGLE-HEAD AREA LIGHT, FLAT LENS, EWL-4" ARM AT 18° 90 DEGREES, 24" BANNERS ARMS AT 11° AND 15° 90 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, EYELETS AT 20° 45 AND 135 DEGREES, EYELETS AT 14° 225 AND 315 DEGREES, DECORATIVE BASE COVER	LUMEC DMS50/RS856V	BLACK	LED	22' POLE	7400	70	4000K	-	TYPE II	54 VA	240
S2C	SINGLE-HEAD AREA LIGHT, FLAT LENS, EWL-4" ARM AT 18° 90 DEGREES, 24" BANNERS ARMS AT 11° AND 15° 90 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, EYELET AT 20° 45 DEGREES, EYELETS AT 14° 225 AND 315 DEGREES, DECORATIVE BASE COVER	LUMEC DMS50/RS856V	BLACK	LED	22' POLE	7400	70	4000K	-	TYPE II	54 VA	240
S2D	SINGLE-HEAD AREA LIGHT, FLAT LENS, EWL-4" ARM AT 18° 90 DEGREES, 24" BANNERS ARMS AT 11° AND 15° 90 DEGREES, FLAG HOLDER AT 15° 6' 270 DEGREES, GFI RCPT AT 17° 270 DEGREES, EYELET AT 20° 135 DEGREES, EYELETS AT 14° 225 AND 315 DEGREES, DECORATIVE BASE COVER	LUMEC DMS50/RS856V	BLACK	LED	22' POLE	7400	70	4000K	-	TYPE II	54 VA	240
S3	CATENARY POLE, POLE CAP, EYELETS AT 14° 45 AND 335 DEGREES, DECORATIVE BASE COVER	LUMEC RS805J	BLACK	-	15' POLE	-	0	-	-	-	0 VA	0
S3A	CATENARY POLE, POLE CAP, EYELETS AT 14° 335 DEGREES, DECORATIVE BASE COVER	LUMEC RS805J	BLACK	-	15' POLE	-	0	-	-	-	0 VA	0
S3B	CATENARY POLE, POLE CAP, EYELETS AT 14° 45 DEGREES, DECORATIVE BASE COVER	LUMEC RS805J	BLACK	-	15' POLE	-	0	-	-	-	0 VA	0
S3C	CATENARY POLE WITH FLOOD LIGHT, 1/2" THREAD IN POLE CAP, EYELETS AT 12.5° 335 DEGREES, DECORATIVE BASE COVER	HADCO B9/LUMEC RS805J	BLACK	LED	15' POLE	3500	70	4000K	-	MEDIUM	33 VA	120
S3D	CATENARY POLE WITH FLOOD LIGHT, 1/2" THREAD IN POLE CAP, EYELETS AT 12.5° 45 DEGREES, DECORATIVE BASE COVER	HADCO B9/LUMEC RS805J	BLACK	LED	15' POLE	3500	70	4000K	-	MEDIUM	33 VA	120
S3F	OUTDOOR LED STRINGER GLOBES, SPACING OF 18" ON CENTER, LENGTH PER PLANS, BLACK WIRE COLOR, POLYCARBONATE CLEAR GLOBES, WET LOCATION RATING, IP67, PROVIDE WITH SUPPORT CABLE WITH A MAX OF 2 FOOT DROP FROM POLE TO CENTER OF STREET AND LOW VOLTAGE NEMA 3R TRANSFORMERS.	TUBE LIGHTING BPS-307	BLACK	LED	SUSPENDED	44 PER LAMP	0	3000K	-	-	2 VA	120
S4	TWO-HEADED AREA LIGHT, FLAT LENS, AC4 ARM AT 18° 90 DEGREES, DECORATIVE BASE COVER	LUMEC DMS50/RS805J	BLACK	LED	22' POLE	7400/HEAD	70	4000K	-	TYPE III	108 VA	240
S5	SIDE BENDING LED NEON, HARDWIRE 20FT CORD, METAL BENDABLE MOUNTING CHANNEL, LENGTH PER PLANS, COORDINATE INPUT SIDE PRIOR TO ORDERING, MOUNT ON UNDERSIDE OF SEATWALL, SEE STREETSCAPE DETAILS FOR MORE INFORMATION	JESCO DL-AC-FLEX2-LNSB	WHITE	LED	SURFACE	24/FT	90	4000K	-	120 DEG	310 VA	120
S5A	SIDE BENDING LED NEON, HARDWIRE 20FT CORD, METAL BENDABLE MOUNTING CHANNEL, LENGTH PER PLANS, COORDINATE INPUT SIDE PRIOR TO ORDERING, MOUNT ON UNDERSIDE OF CAST STONE CAP, SEE LANDSCAPING DETAILS FOR MORE INFORMATION	JESCO DL-AC-FLEX2-LNSB	WHITE	LED	SURFACE	24/FT	90	4000K	-	120 DEG	70 VA	120

BRANCH PANELBOARD: LCMM													
LOCATION: CORNER OF MAIN				VOLTAGE: 240/120 Single				MAIN DEVICE: MCB 200A					
MOUNTING: GROUND				PHASE: 1				BUS RATING: 200					
ENCLOSURE: NEMA 3R				WIRE: 3				NEUTRAL RATING: 100.00%					
FED FROM:				LUGS: Standard				A.I.C. RATING: 22,000					
CKT #	CKT BKR A / P	NOTES	CIRCUIT DESCRIPTION	KVA LOAD 'PHASE A'	KVA LOAD 'PHASE B'	CIRCUIT DESCRIPTION	NOTES	CKT BKR P / A	CKT #				
1	20 A	2	STREET LIGHTS - NORTH MAIN ST	0.3	0.4	STREET LIGHTS - SOUTH MAIN ST		2	20 A	2			
3											4		
5	20 A	2		STREET LIGHTS - NORTH CENTER ST	0.3		0.3	STREET LIGHTS - SOUTH CENTER ST		2	20 A	6	
7											8		
9	20 A	1	RECEPTACLES - NORTH MAIN ST		1.3	1.3	RECEPTACLES - SOUTH MAIN ST			1	20 A	10	
11	20 A	1		RECEPTACLES - NORTH CENTER ST	1.4	1.3		RECEPTACLES - SOUTH CENTER ST		1	20 A	12	
13	20 A	1									1	20 A	14
15	70 A	2	PED-1 EAST		4.2	4.2	PED-1 WEST			2	70 A	16	
17													18
19	20 A	1		CATENARY LIGHTING				1.7	0.2	IRRIGATION CONTROLLER		1	20 A
21	20 A	1	SPARE	0	0	SPARE		1	20 A	22			
23	20 A	1	SPARE			SPARE		1	20 A	24			
TOTAL CONNECTED KVA BY PHASE				14.9 kVA	13.4 kVA								
TOTAL CONNECTED AMPS BY PHASE				124 A	111.4 A								
LOAD CLASSIFICATION													
Lighting			4186 VA	100.00%		4186 VA		PANELBOARD TOTALS					
Receptacle			23820 VA	70.99%		16910 VA		TOTAL CONNECTED KVA					
Power			240 VA	100.00%		240 VA		TOTAL CALCULATED KVA					
								TOTAL CONNECTED AMPS					
								TOTAL CALCULATED AMPS					
NOTES:													

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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

EROSION CONTROL

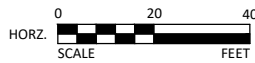
SHEET

R.01

EROSION CONTROL LEGEND

- SILT FENCE/FILTER SOCK
- INLET PROTECTION
- SOD

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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION

EROSION CONTROL

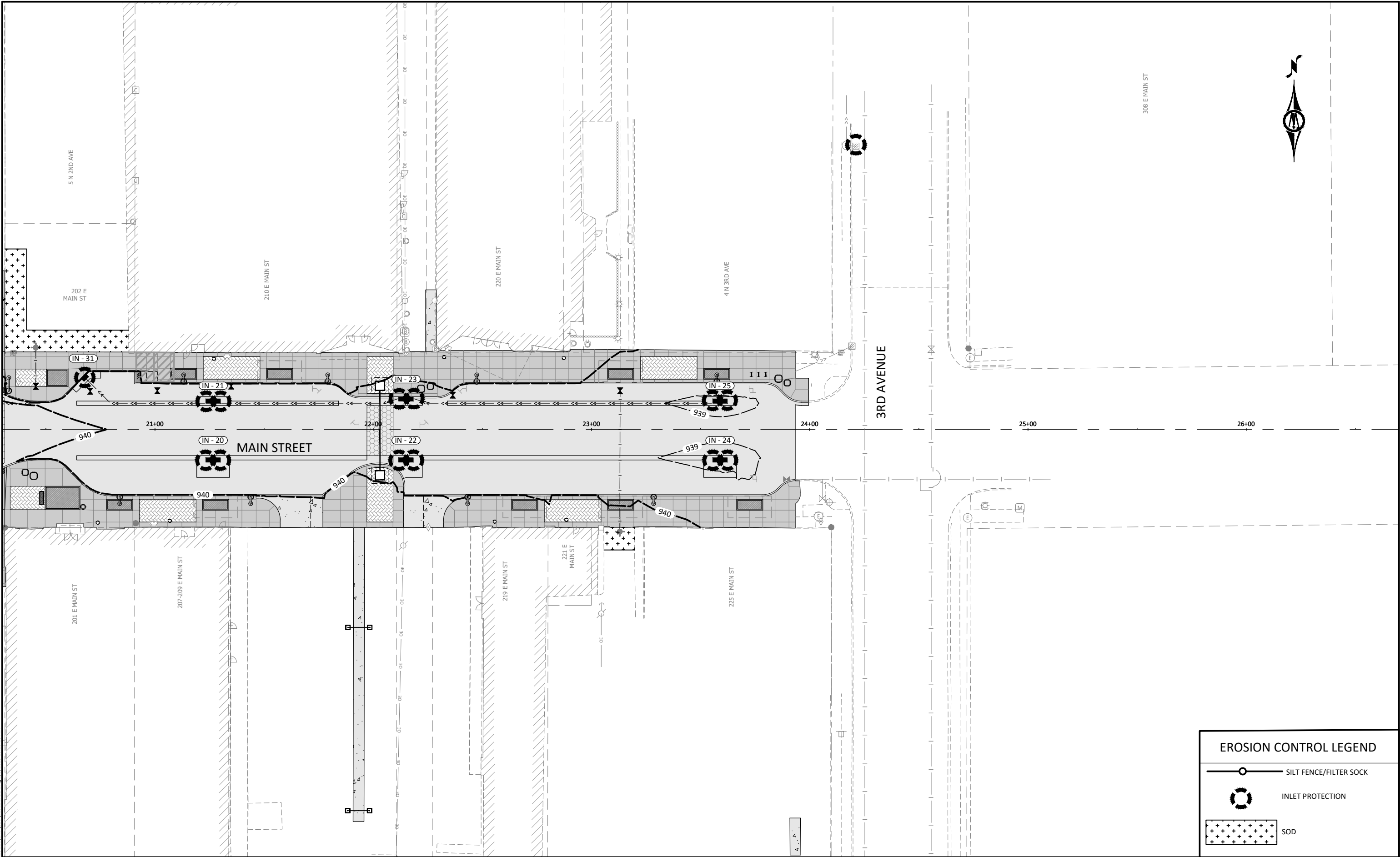
SHEET

R.02

EROSION CONTROL LEGEND

- SILT FENCE/FILTER SOCK
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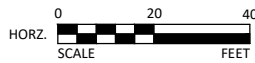
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MAIN STREET RECONSTRUCTION

EROSION CONTROL

SHEET

R.03

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EROSION CONTROL

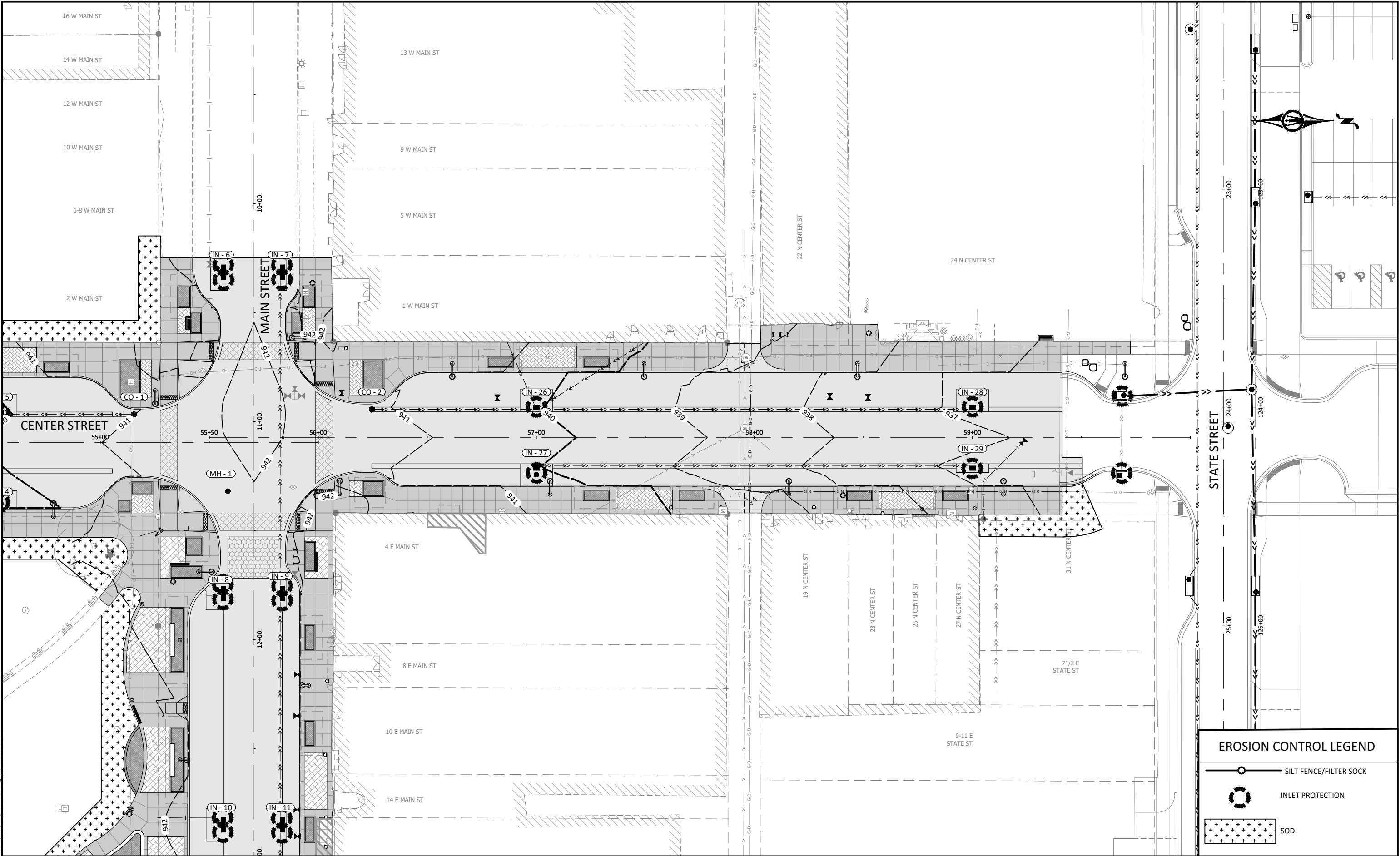
SHEET

R.04

EROSION CONTROL LEGEND

- SILT FENCE/FILTER SOCK
- INLET PROTECTION
- SOD

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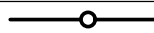
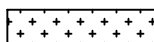
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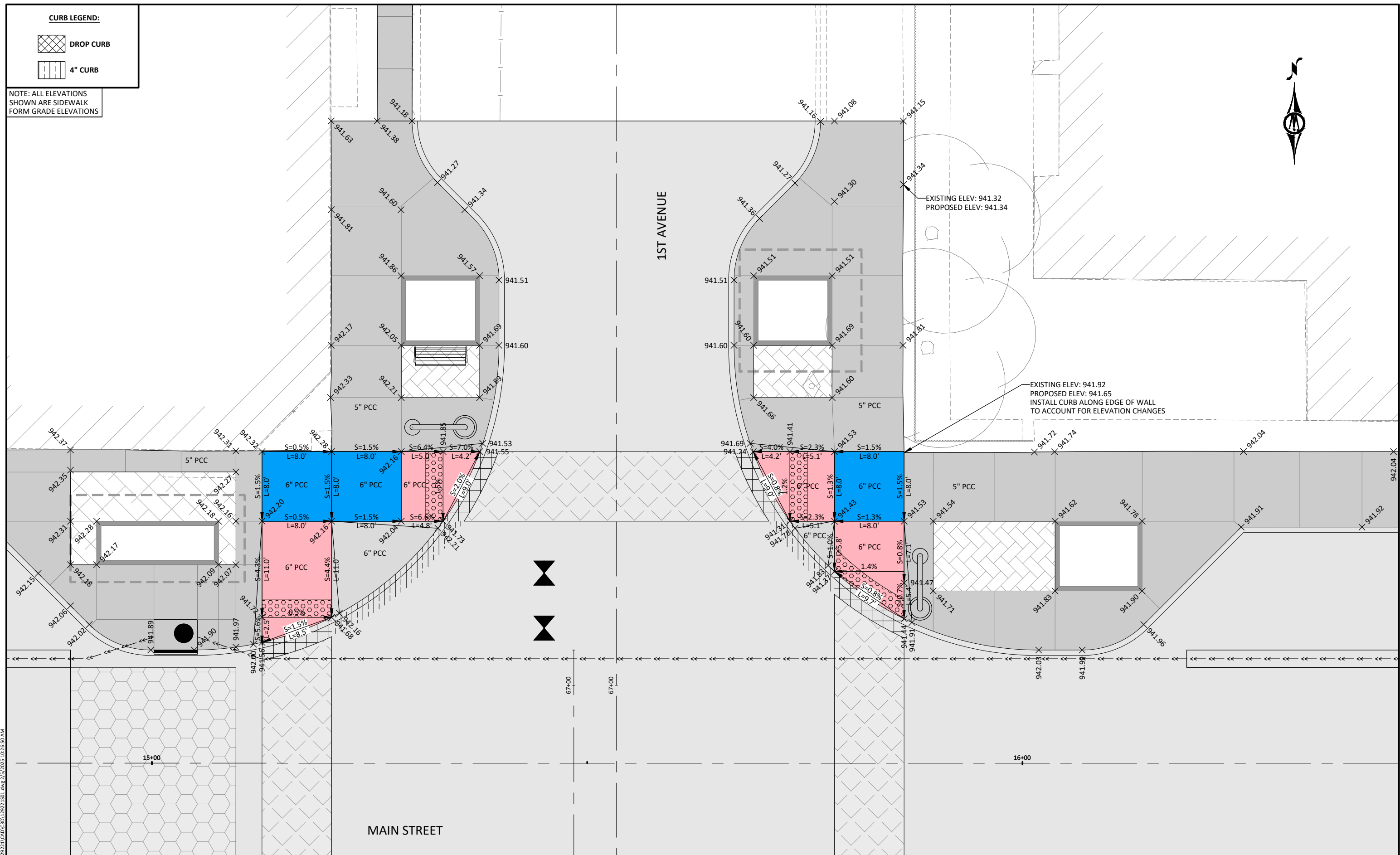
EROSION CONTROL

SHEET

R.05

EROSION CONTROL LEGEND

-  SILT FENCE/FILTER SOCK
-  INLET PROTECTION
-  SOD

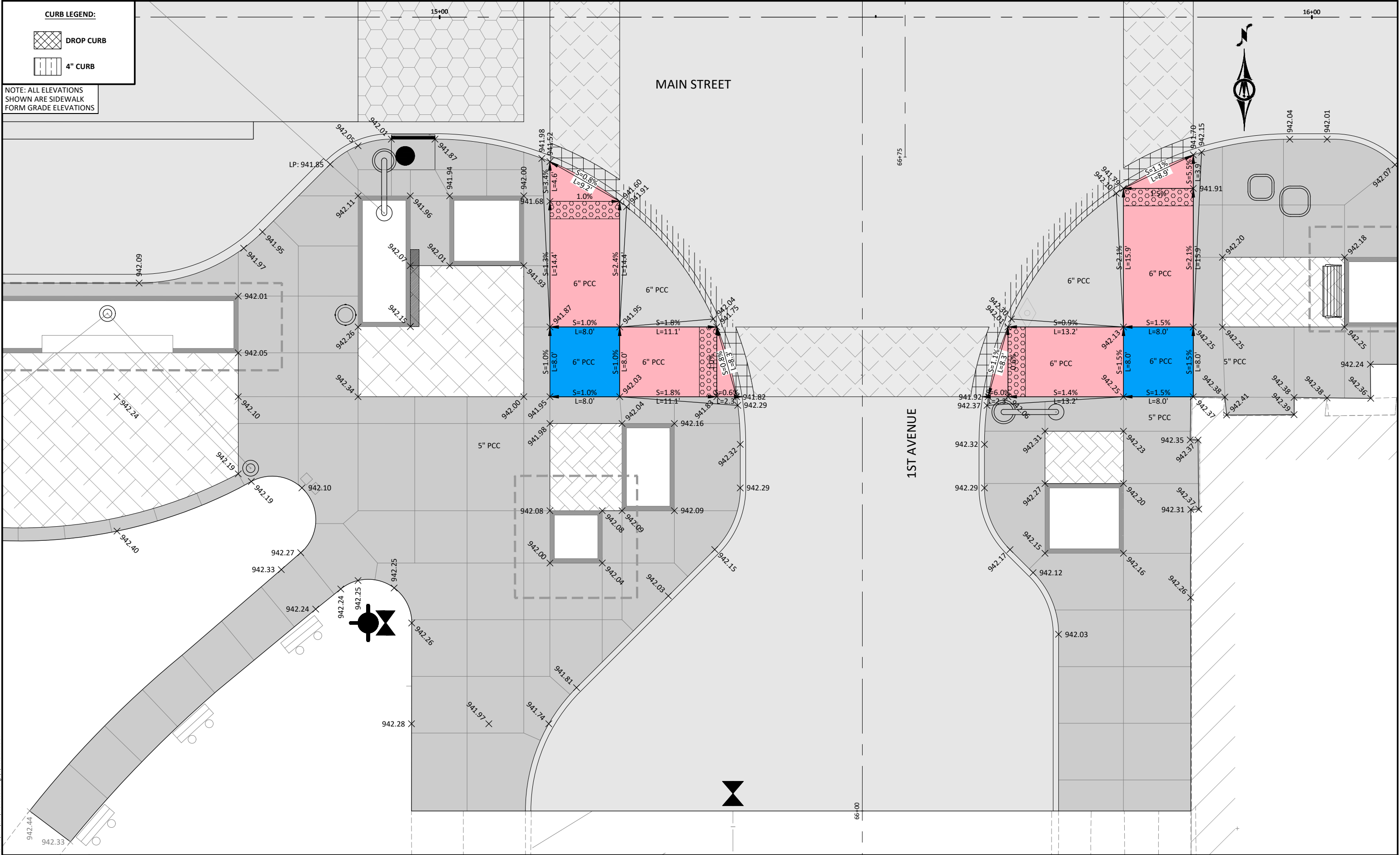


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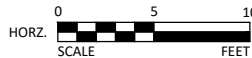
 DROP CURB

 4" CURB

NOTE: ALL ELEVATIONS SHOWN ARE SIDEWALK FORM GRADE ELEVATIONS



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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
SIDEWALK PLAN

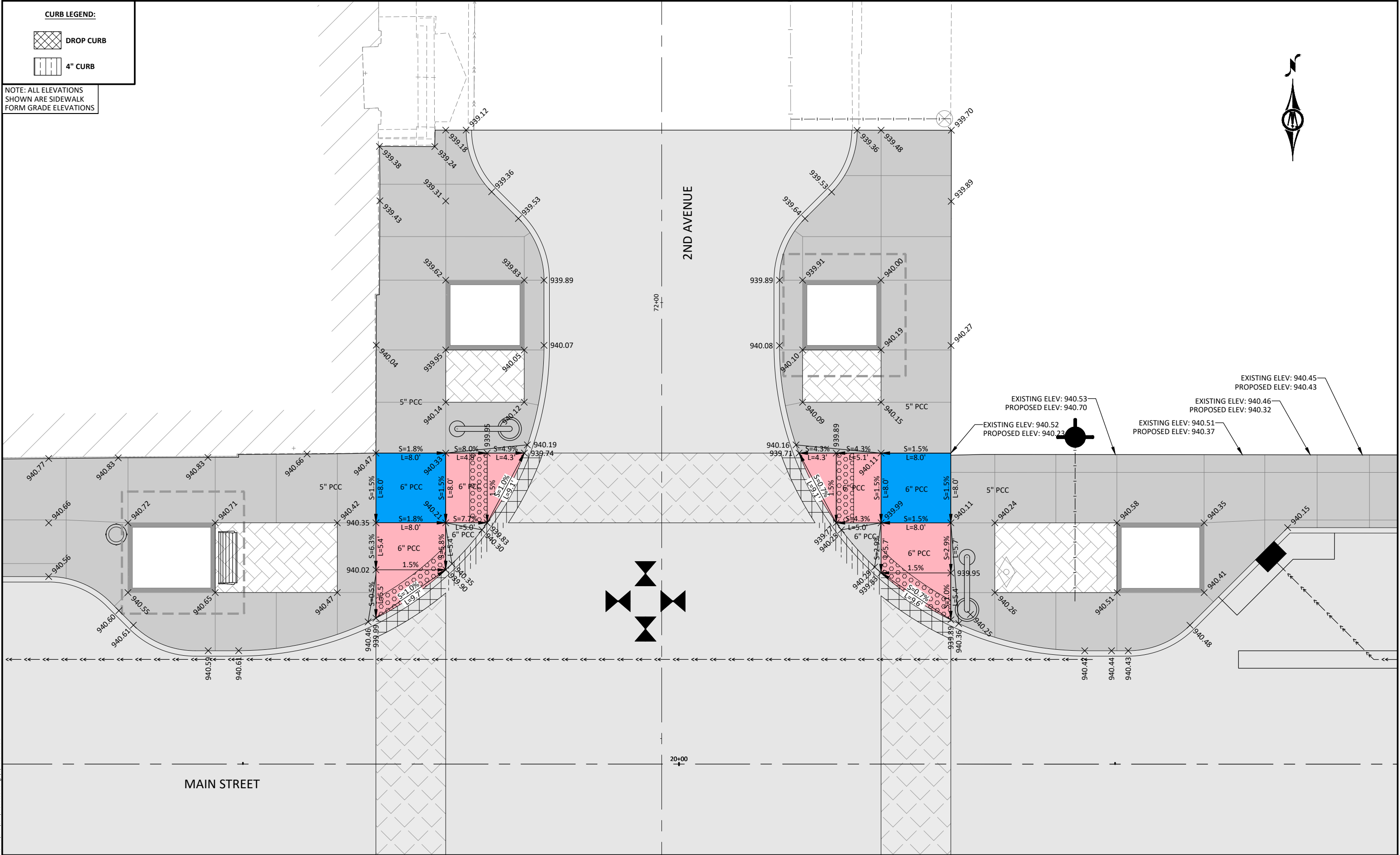
SHEET
S.04

CURB LEGEND:

 DROP CURB

 4" CURB

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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
SIDEWALK PLAN

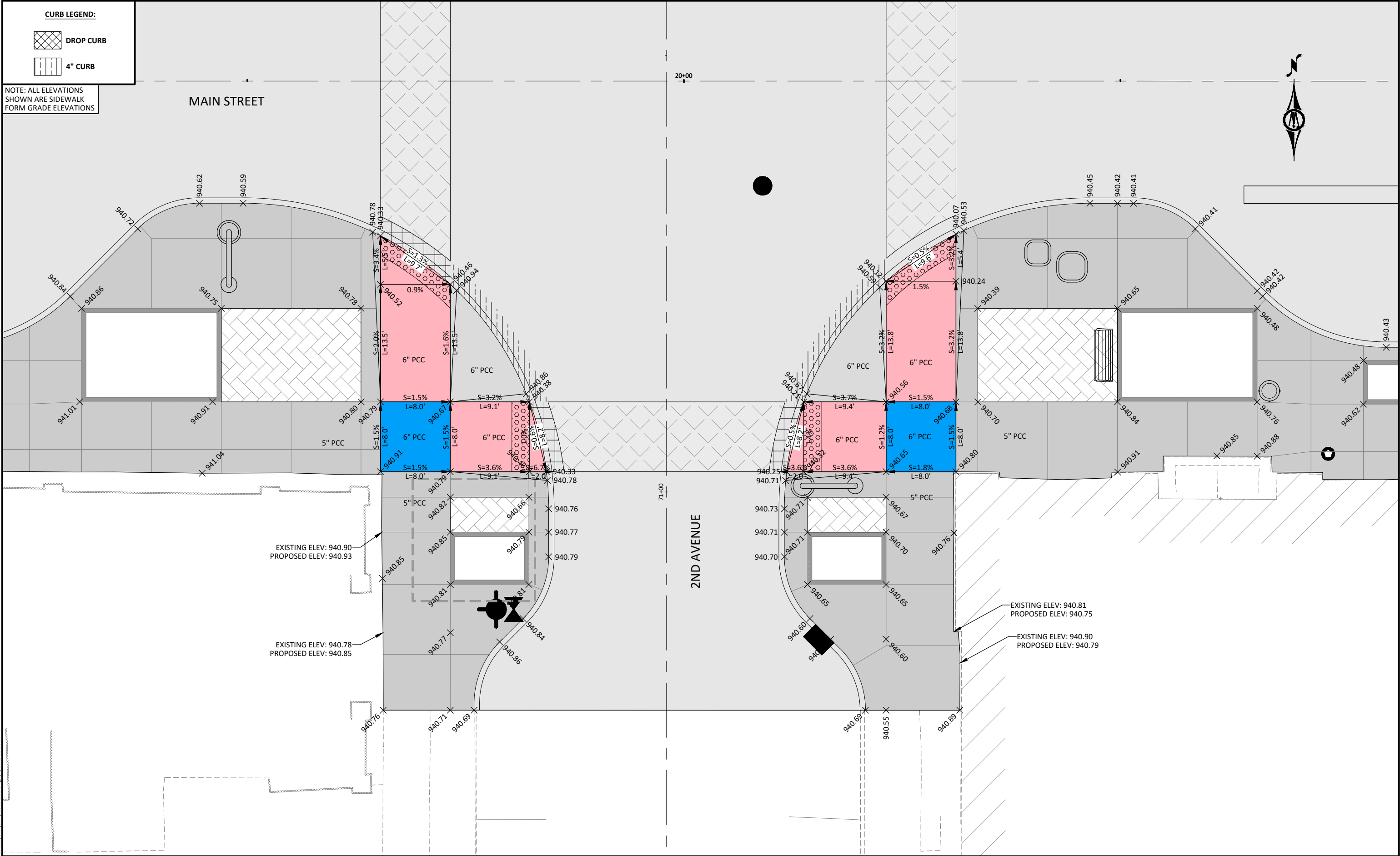
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CURB LEGEND:

 DROP CURB

 4" CURB

NOTE: ALL ELEVATIONS SHOWN ARE SIDEWALK FORM GRADE ELEVATIONS



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SIDEWALK PLAN

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S.06



 **DROP CURB**

 **4" CURB**

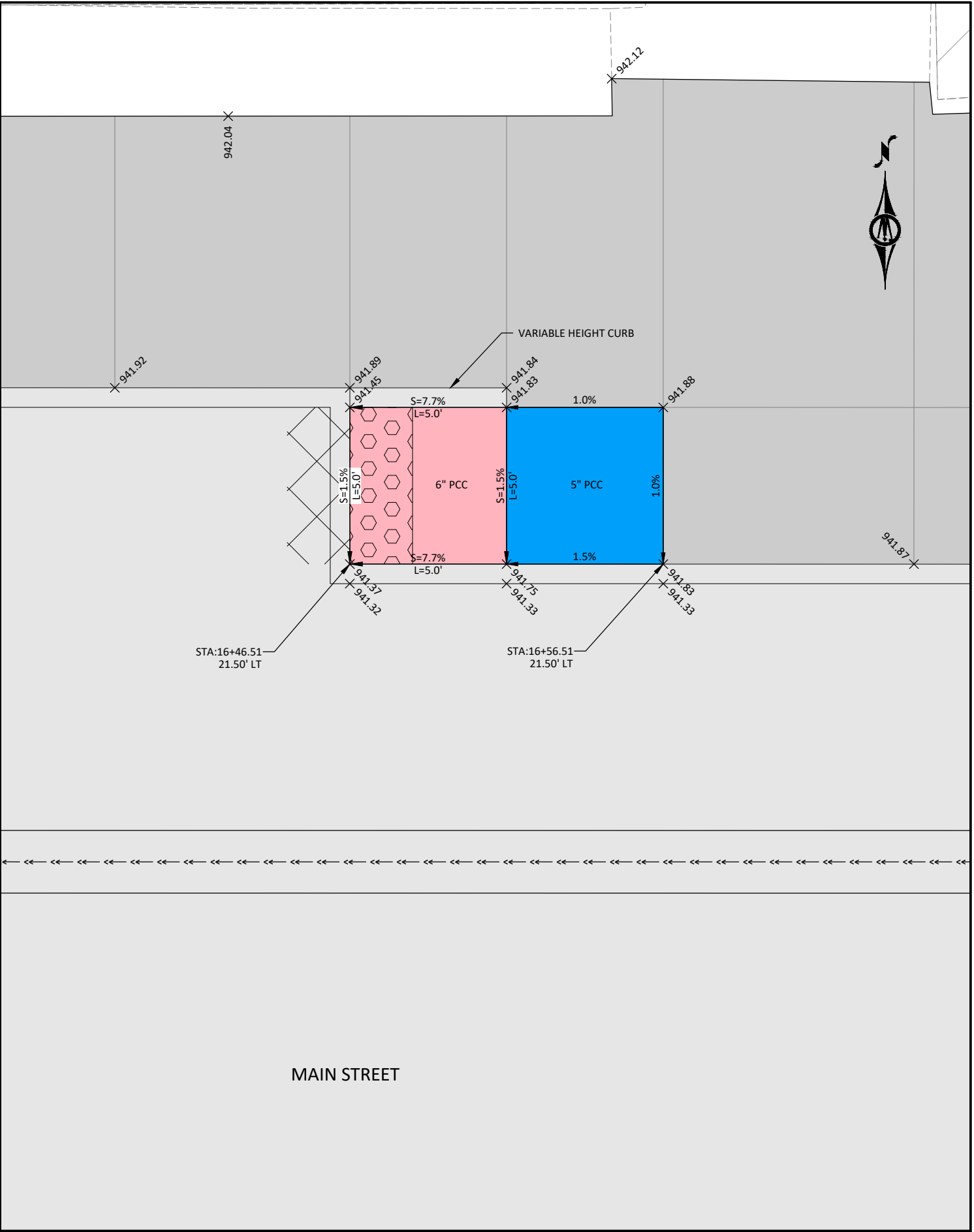
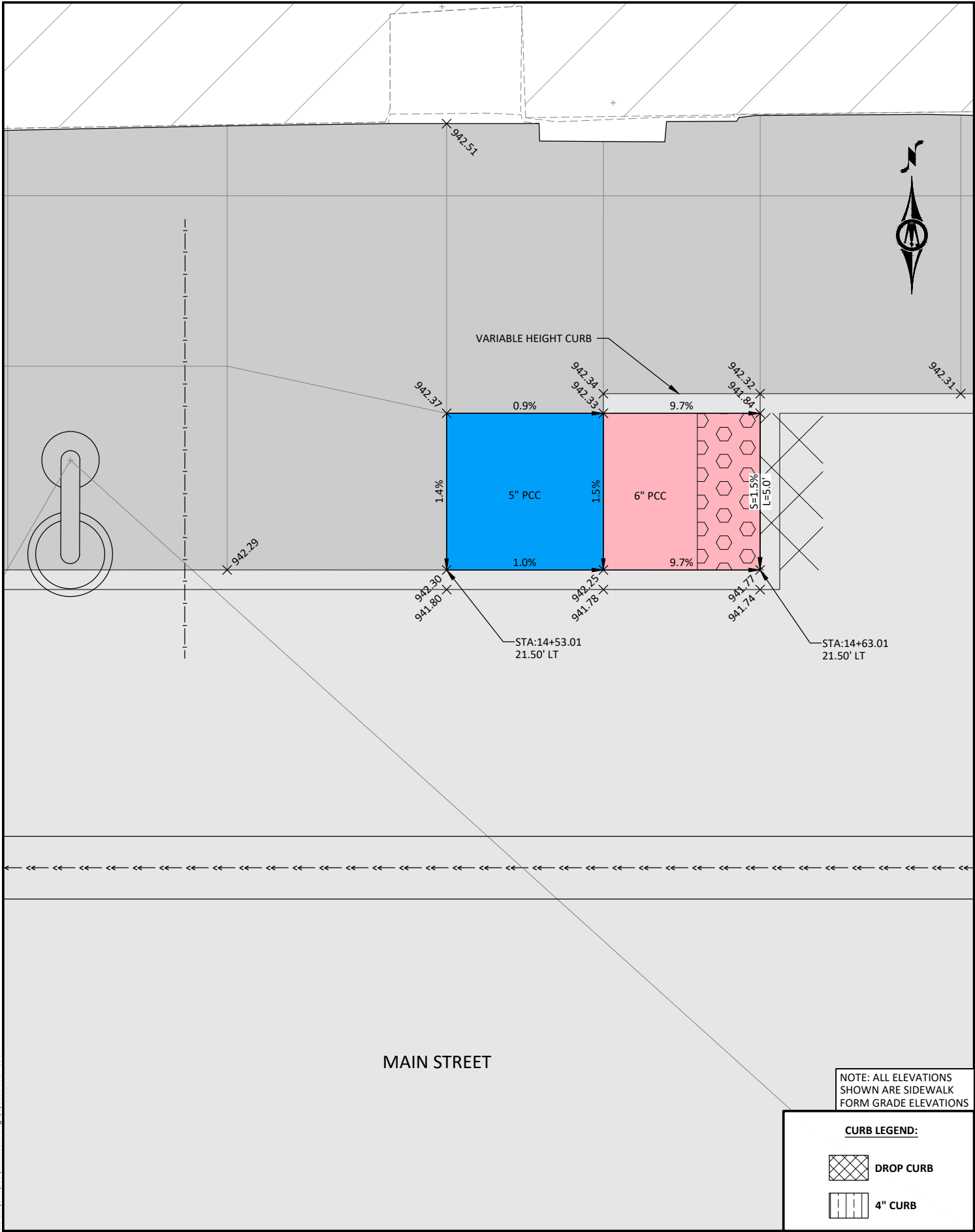
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SIDEWALK PLAN



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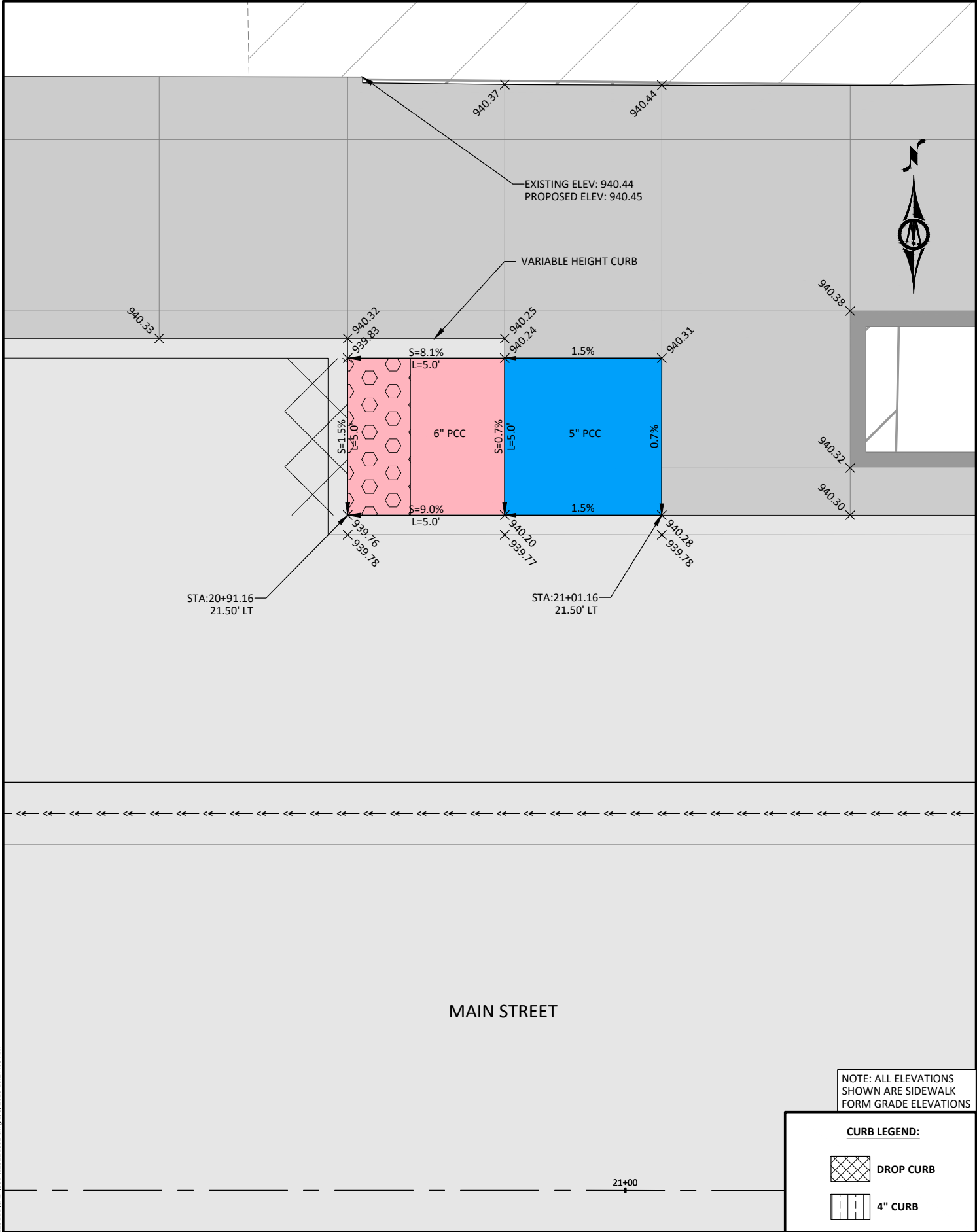
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MAIN STREET RECONSTRUCTION
SIDEWALK PLAN

SHEET
S.08

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CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
SIDEWALK PLAN

SHEET
S.09

Vault Replacement Notes for 24 E. Main Street (Bowman Building):

1. Prior to Construction (Property Owner Responsibility)
- a. Property Owner will install new fire pump inside of basement.

b. Property Owner connects to existing fire service in the vault and runs new fire service line from vault to new fire pump location in the building.

c. Property Owner shall relocate water meter for domestic service inside the basement and relocate/replumb all domestic lines, so they are not needed inside the vault.

d. Property Owner removes existing fire pump and all other utilities or debris in the vault.

e. Property Owner shall coordinate with fire sprinkler company for any necessary checks/reviews throughout the construction process or after new fire service line is installed.

f. Property Owner is responsible for all wall repairs needed inside the building beyond the masonry wall the city will provide to close up the openings
2. Construction Responsibility
- a. Contractor shall ensure existing building is protected during the vault work. Any damage caused by vault work shall be the responsibility of the contractor and shall be fixed at the expense of the contractor.

b. Contractor shall remove portion or entire vault top to provide access to the existing vault. Contractor shall ensure no debris, water or other items are allowed to enter the existing basement. Any damage shall be fixed at the expense of the contractor.

c. Contractor shall block-in existing openings in the basement wall per the plans and details.

d. Contractor shall remove remainder of vault top if only a portion was removed.

e. Contractor shall install water proofing along entire frontage of the property according to detail and specifications.

f. Contractor shall demo existing vault walls to a depth of at least 24" below finished grade of the sidewalk

g. Contractor shall install new water fire service into the vault and make connection to new service line leading to fire pump.

h. Contractor shall connect to domestic service line tapped into the new fire service line outside of the building face but in the vault and install new curb stop on domestic service line.

i. Contractor shall drill holes in existing vault floor slab according to property details shown on v sheets.

j. Contractor shall fill existing vault according to v sheets.

k. Contractor shall construct new sidewalk.

Vault Replacement Notes for 16 E. Main Street (City Centre Building):

1. Prior to Construction (Property Owner Responsibility)
- a. Property Owner will install new fire pump in new vault location

b. Property Owner connects to existing fire service in the vault and runs new fire service line from vault to new fire pump location in the vault location.

c. Property Owner shall relocate water meter for domestic service inside the basement and relocate/replumb all domestic lines, so they are not needed inside the vault that will be removed.

d. Property Owner removes existing fire pump and all other utilities or debris in the vault.

e. Property Owner shall coordinate with fire sprinkler company for any necessary checks/reviews throughout the construction process or after new fire service line is installed.

f. Property Owner is responsible for all wall repairs needed inside the building beyond the masonry wall the city will provide to close up the openings
2. Construction Responsibility
- a. Contractor shall ensure existing building is protected during the vault work. Any damage caused by vault work shall be the responsibility of the contractor and shall be fixed at the expense of the contractor.

b. Contractor shall remove portion or entire vault top to provide access to the existing vault. Contractor shall ensure no debris, water or other items are allowed to enter the existing basement. Any damage shall be fixed at the expense of the contractor.

c. Contractor shall build new vault walls around relocated fire pump.

d. Contractor shall block-in existing openings in the basement wall per the plans and details.

e. Contractor shall remove remainder of vault top if only a portion was removed.

f. Contractor shall install waterproofing along entire frontage of the property and new vault walls according to detail and specifications.

g. Contractor shall demo existing vault walls to a depth of at least 24" below finished grade of the sidewalk

h. Contractor shall install new water fire service into the vault and make connection to new service line leading to fire pump.

i. Contractor shall connect to domestic service line tapped into the new fire service line outside of the building face but in the vault and install new curb stop on domestic service line.

i. Contractor shall drill holes in existing vault floor slab according to property details shown on v sheets.

j. Contractor shall fill existing vault according to v sheets.

k. Contractor shall construct new vault top over relocated fire pump.

i. Contractor shall construct new sidewalk.

Vault Replacement Notes - 19 S. Center Street:

1. Prior to Construction (Property Owner Responsibility)
- a. Property Owner shall relocate water meter through coordination with Marshalltown water works to ensure water meter and service lines meet Marshalltown water works requirements. Water service line shall be stubbed through the existing wall.

b. Property Owner to remove all debris and miscellaneous items from the vault.

c. Property Owner will remove any existing building utilities located in the vault including but not limited to electrical, fire sprinkler runs, communication, etc.
2. Construction (City's Responsibility)
- a. Contractor shall ensure existing building is protected during the vault work. Any damage caused by vault work shall be the responsibility of the contractor and shall be fixed at the expense of the contractor.

b. Contractor shall remove portion or entire vault top to provide access to the existing vault. Contractor shall ensure no debris, water or other items are allowed to enter the existing basement. Any damage shall be fixed at the expense of the contractor.

c. Contractor shall block-in existing openings in the basement wall per the plans and details.

d. Contractor shall remove remainder of vault top if only a portion was removed.

e. Contractor shall install water proofing along entire frontage of the property according to detail and specifications.

f. Contractor shall demo existing vault walls to a depth of at least 24" below finished grade of the sidewalk

g. Contractor shall install new service line and connect to new service line stubbed through the wall.

h. Contractor shall drill holes in existing vault floor slab according to property details shown on v sheets.

i. Contractor shall fill existing vault with modified subbase

j. Contractor shall construct new sidewalk.

Vault Replacement Notes - 210 E. Main Street:

1. Prior to Construction (Property Owner Responsibility)
- a. Property Owner will remove any existing building utilities located in the vault including but not limited to electrical, fire sprinkler runs, communication etc.

b. Property Owner to remove all debris and miscellaneous items from the vault.

c. Property Owner shall coordinate with fire sprinkler company for any necessary checks/reviews throughout the construction process or after new fire service line is installed.
2. Construction (City's Responsibility)
- a. Contractor shall ensure existing building is protected during the vault work. Any damage caused by vault work shall be the responsibility of the contractor and shall be fixed at the expense of the contractor.

b. Contractor shall remove portion or entire vault top to provide access to the existing vault. Contractor shall ensure no debris, water or other items are allowed to enter the existing basement. Any damage shall be fixed at the expense of the contractor.

c. Contractor shall block-in existing openings in the basement wall per the plans and details.

d. Contractor shall remove remainder of vault top if only a portion was removed.

e. Contractor shall install water proofing along entire frontage of the property according to detail and specifications.

f. Contractor shall demo existing vault walls to a depth of at least 24" below finished grade of the sidewalk

g. Contractor shall drill holes in existing vault floor slab according to property details shown on v sheets.

h. Contractor shall fill existing vault according to v sheets.

i. Contractor shall construct new sidewalk.

Stairway Removal Notes - 4 E. Main Street (Zamora):

1. Property Owner Responsibility
- a. Property Owner shall re-pipe vent outlet for coolers

b. Property Owner shall establish a new doorway into basement area that will be blocked off when the stairway is removed.
2. Construction (City's Responsibility)
- a. Contractor shall remove existing door and block-in opening.

b. Contractor shall remove existing sidewalk, stair, and handrail.

c. Contractor shall waterproof new block-in opening and any other portions of the existing wall that are exposed.

d. Contractor shall fill existing vault according to v sheets.

e. Contractor shall construct new sidewalk.

Miscellaneous Notes:

1. Vaults located at 16 E. Main and 24 E. Main may be completed at the same time.



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AMES, IOWA 50010
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Email: Ames@bolton-menk.com
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DESIGNED	REV	DESCRIPTION	DATE
	A	90% PROGRESS PLANS	12/20/2024
DRAWN	DEM		
CHECKED	GAB		
CLIENT PROJ. NO.	0A1.129221		

CITY OF MARSHALLTOWN, IOWA

MAIN STREET RECONSTRUCTION

STRUCTURAL PLAN

SHEET

V.00

STRUCTURAL DRAWING INDEX

NO.	SHEET NAME
V.01	NOTES/COVER SHEET
V.02	BDH BUILDING
V.03	BOWMAN BUILDING - PLAN AND DETAILS
V.04	BOWMAN BUILDING - DETAILS
V.05	ZAMORAS BUILDING
V.06	CITY CENTER BUILDING - PLAN VIEW
V.07	CITY CENTER BUILDING - WALL SECTIONS
V.08	CITY CENTER BUILDING - WALL SECTION
V.09	OLIVER BEAN BUILDING

DESIGN NOTES

BUILDING CODES: IBC - 2021 EDITION

ELEVATIONS GIVEN ARE IN RESPECT TO BASEMENT FLOOR OF EACH BUILDING.

MINIMUM CONCRETE STRENGTH (28 DAY) = 4000 PSI

ALL CONCRETE FOR EXTERIOR USE SHALL BE AIR ENTRAINED.

MAXIMUM SLUMP SHALL BE 4"

CONCRETE REINFORCEMENT: = ASTM A615 GRADE 60

SECURELY TIE ALL REINFORCING AND EMBEDDED ITEMS IN POSITION BEFORE PLACING CONCRETE OR GROUT.

MASONRY:

HOLLOW CORE UNITS: F'm = 1500 PSI

REINFORCING: ASTM A615 GRADE 60

#9 GALV. TRUSS TYPE LADDERS HORIZONTAL

LAP SPLICES FOR REINFORCING = MINIMUM 2'-0"

MORTAR AND GROUT PER THE LATEST EDITIONS OF ASTM C150, TYPE 1;

C207 TYPE 5, C144; C404 AND C270.

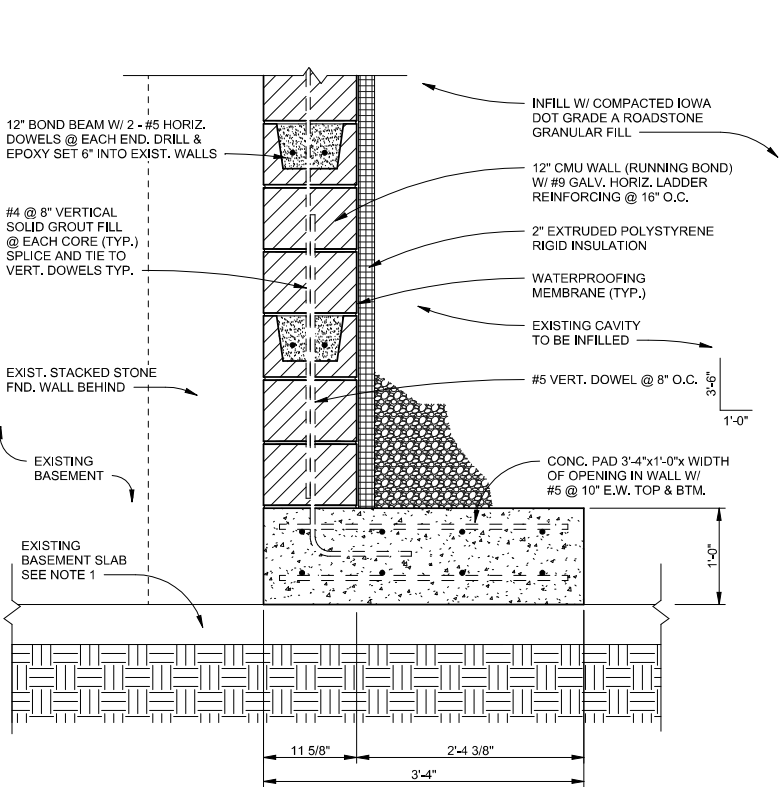
MASONRY GROUT: 3000 PSI W/ 8" SLUMP

GRANULAR INFILL MATERIAL FOR CAVITY SPACES UNDER NEW SIDEWALKS TO BE COMPACTED "IOWA DOT CLASS A ROAD STONE (GRADATION #11)" UNLESS NOTED. SPREAD THE CLASS A ROADSTONE IN LIFTS NOT EXCEEDING 12" IN COMPACTED THICKNESS. COMPACT EACH LAYER A MINIMUM OF 95 PERCENT OF THE MATERIALS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR).

IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE ALLOWABLE CONSTRUCTION LIVE LOADS.

GENERAL NOTES

- ALL EXISTING CONDITIONS AND DIMENSIONS TO, OF AND IN EXISTING BUILDINGS, ARE TO BE FIELD VERIFIED PRIOR TO BEGINNING CONSTRUCTION. NOTIFY ENGINEER OF ANY DISCREPANCIES OR INCONSISTENCIES.
- FOR EXISTING CAVITIES UNDER SIDEWALKS NOTED ON THE DRAWINGS, EXISTING SIDEWALK ABOVE AND ANY SIDEWALK SUPPORT STRUCTURE (DECK, BEAMS, COLUMNS, ETC.) IS TO BE REMOVED, UNLESS NOTED. IN ORDER FOR CAVITY TO BE FILLED WITH COMPACTED GRANULAR FILL AND NEW SIDEWALK POURED OVER TOP. (TYPICAL)
- ALL EXISTING WALLS ARE TO BE BRACED UNTIL ALL NEW COMPACTED GRANULAR FILL IS INSTALLED.
- REMOVE ALL EXTERIOR SIDEWALK CAVITY WALLS TO MIN. 24" BELOW NEW FINISHED SIDEWALK ELEVATIONS.
- ANY EXISTING WOOD WINDOWS OR DOORS MARKED FOR REMOVAL ARE TO BE REMOVED IN THEIR ENTIRETY, INCLUDING JAMBS, HEADS AND SILLS. WALLS TO BE REPAIRED AS REQUIRED FOR INFILL OF CMU BLOCKING.
- REMOVE ANY EXISTING WOOD TRIM OR FRAMING AROUND OPENINGS TO BE INFILLED. CLEAN AND PREPARE EXISTING STONE/BLOCK WALLS AS REQUIRED FOR NEW CMU WALLS AND HORIZONTAL DOWELS.
- HORIZONTAL DOWELS WILL BE DRILLED AND EPOXY SET INTO EXISTING STONE/BLOCK FOUNDATION WALLS WITH A MINIMUM 6" EMBEDMENT.
- ALL CAVITIES AND AREAS MARKED FOR INFILL UNDER THE NEW SIDEWALKS ARE TO BE CLEANED OF ALL DEBRIS, WOOD SHELVES AND OTHER ITEMS MADE FROM WOOD. LOOSE ITEMS, FIELD VERIFY WHETHER ANY EXISTING CONDUIT OR PIPING IS TO REMAIN IN PLACE. STABILIZE OR REMOVE AS INSTRUCTED.
- PRIOR TO INFILLING CAVITIES, OR BLOCKING OFF OPENINGS, DRILL 1"Ø HOLES THRU EXISTING FLOOR SLABS IN CAVITY AREAS TO ALLOW FOR PROPER DRAINAGE AFTER INSTALLATION OF GRANULAR INFILL. SEE PLANS FOR APPROXIMATE DRILLING LOCATIONS.
- EXISTING MANHOLES ABOVE ARE SHOWN FOR REFERENCE ONLY. MANHOLES WILL BE REMOVED DURING INSTALLATION OF NEW INFILL AND SIDEWALK INSTALLATION.
- INSTALL ALL NEW INFILL CMU WALLS TO UNDERSIDE OF EXISTING LINTELS/FLOOR FRAMING LEAVING NO GAPS OR VOIDS. COMPLETELY FILL ANY GAPS OR VOIDS WITH NON-SHRINK GROUT AND SEAL WATER TIGHT BETWEEN NEW INFILL CMU WALLS AND EXISTING LINTELS/FLOOR FRAMING.
- FOR EXISTING STEEL LINTELS AND CAVITY STEEL BEAMS THAT REMAIN, REMOVE ALL RUST FROM ALL EXPOSED STEEL SURFACES, CLEAN, AND EPOXY PRIME AND PAINT ALL EXPOSED STEEL SURFACES.
- WHERE EXISTING STEEL LINTEL IS A WIDE FLANGE BEAM OR SIMILAR, CUT AND INSTALL CMU INFILL BLOCK AROUND EXISTING EXPOSED STEEL WIDE FLANGE LINTELS AS REQUIRED.
- FILL IN ALL VOIDS WITH SOLID CONCRETE BLOCKS AND CEMENTITIOUS MORTAR/GROUT. SEAL WATERTIGHT. TYPICAL FOR ALL OPENINGS.



NOTE 1: FOR ALL CAVITIES, AT BOTTOM OF CAVITY OPENING TO BE INFILLED IF BASEMENT SLAB IS LESS THAN 6" THICK OR IS CRACKED AND DAMAGED AT CAVITY OPENING AND CAVITY OPENING DETAIL DOES NOT ALREADY SHOW A NEW WALL FOOTING AT THE BOTTOM OF THE OPENING USE ALTERNATE WALL SECTION.

ALTERNATE WALL SECTION AT BOTTOM OF CAVITY OPENING
1" = 1'-0"

A
V.01

CMU INFILL NOTES:

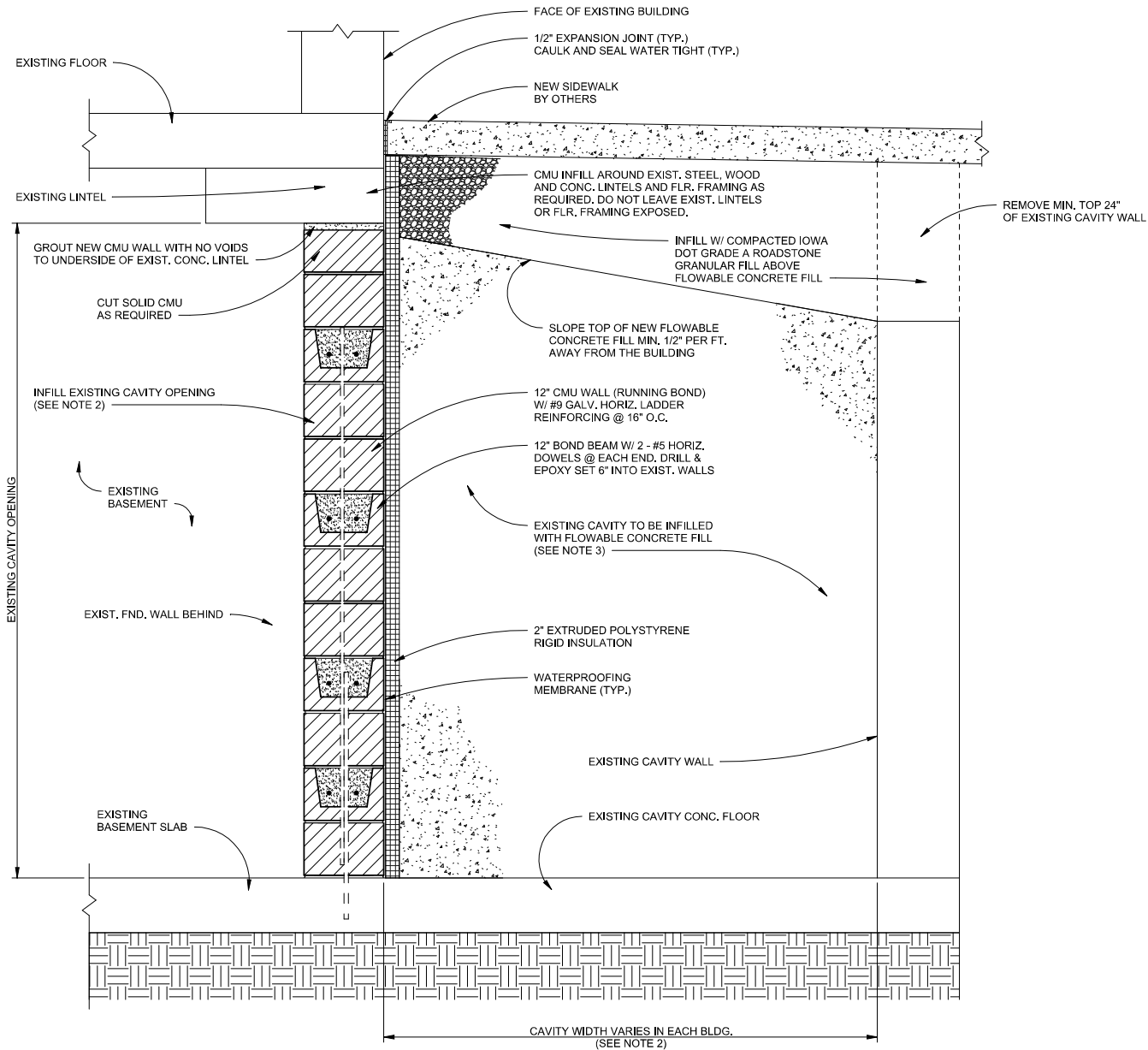
INSTALL ALL NEW INFILL CMU WALLS AS HIGH AS POSSIBLE TO UNDERSIDE OF EXISTING LINTELS/FLOOR FRAMING.

FOR EXISTING STEEL LINTELS, REMOVE ALL RUST FROM ALL EXPOSED STEEL SURFACES, CLEAN, AND EPOXY PRIME AND PAINT ALL EXPOSED STEEL SURFACES.

WHERE EXISTING STEEL LINTEL IS A WIDE FLANGE BEAM OR SIMILAR, CUT AND INSTALL CMU INFILL BLOCK AROUND EXISTING EXPOSED STEEL WIDE FLANGE LINTELS AS REQUIRED. DO NOT LEAVE ANY STEEL EXPOSED TO THE EXTERIOR OF THE BUILDING.

FILL IN ALL VOIDS WITH SOLID CONCRETE BLOCKS AND CEMENTITIOUS MORTAR/GROUT. SEAL WATERTIGHT. TYPICAL FOR ALL OPENINGS.

PROVIDE WATERPROOFING MEMBRANE ON CAVITY SIDE OF EACH WALL BETWEEN THE EXISTING BASEMENT AND CAVITY THAT WILL BE INFILLED. FOR A NEW CMU WALL, OR NEW CMU BLOCK INFILL AT AN OPENING, INSTALL THIS NEW CMU BLOCK WITH THE MORTAR JOINTS FINISHED FLUSH WITH THE CMU BLOCK ON THE CAVITY SIDE, SO THE CMU BLOCK SURFACE IS LEVEL AT THE MORTAR JOINTS ON THE CAVITY SIDE. WHERE THIS WALL IS AN EXISTING STACKED STONE OR AN EXISTING MASONRY WALL WITH INDENTED MORTAR JOINTS, ON THE CAVITY SIDE FACE OF THIS WALL THAT WILL BE WATERPROOFED, REMOVE ALL LOOSE STONES, LOOSE MORTAR, DIRT, ETC. APPLY A HEAVY COAT OF CEMENTITIOUS REPAIR MORTAR FILLING ALL VOIDS AND CRACKS BETWEEN THE STACKED STONES OR FILLING ALL MORTAR JOINTS ON EXISTING MASONRY WALLS. USE SIKAGUICK VOH OR EQUAL FOR THE CEMENTITIOUS MORTAR. APPLY THE CEMENT MORTAR SO THE OUTSIDE SURFACE IS LEVEL WITHOUT VOIDS. WET CURE AFTER FINISHING. ON THE CAVITY SIDE OF THIS WALL, OVER BOTH THE NEW CMU BLOCK AND THE EXISTING BASEMENT WALL WITH THE CEMENT MORTAR COVERING. FOR WATERPROOFING PROTECTION, EITHER APPLY 2 SPRAY-ON COATS OF SEALMASTIC SEMI-MASTIC, 2 BRUSH-ON COATS OF SEALMASTIC SEMI-MASTIC, OR 2 TROWEL-ON COATS OF SEALMASTIC TROWEL-MASTIC BY WR MEADOWS OR EQUAL. THE CONTRACTOR CAN ALSO USE AS A WATERPROOFING MEMBRANE 2 COATS OF SIKALASTIC 320 NS APPLIED WITH A BRUSH, ROLLER, OR TROWEL. OR 2 SPRAY-ON COATS OF SIKALASTIC 320 SG BY SIKKA CORP OR EQUAL. IF AN EXISTING CAVITY MASONRY WALL THAT WILL RECEIVE A WATERPROOF COATING DOES NOT HAVE LARGE VOIDS OR DEEP MORTAR JOINTS, WILL NOT RECEIVE A CEMENT MORTAR COVERING, HAS A POROUS SURFACE, AND IF USING THE SIKALASTIC 320, APPLY A COAT OF SIKALASTIC FTP LO-VOC PRIMER FIRST. APPLY SIKAGUICK VOH AND WATERPROOFING PRODUCTS ACCORDING TO MANUFACTURER'S PRODUCT DATA SHEET. FULLY COVER THIS EXISTING WALL ON THE CAVITY SIDE FROM BASE TO TOP. ESPECIALLY FULLY COAT AND WATERPROOF THE INTERSECTION OF THE WALL AND THE CONCRETE FLOOR AT THE BASE OF THE WALL. INSTALL 2" RIGID INSULATION OVER WATERPROOFING PRODUCT TO PROTECT WATERPROOFING PRODUCT BEFORE FILL CAVITY WITH COMPACTED ROCK, OR FLOWABLE CONCRETE GROUT FILL.

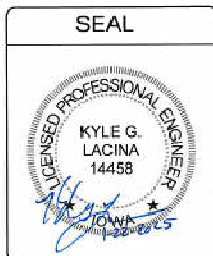


NOTE 2: FOR EACH EXISTING CAVITY OPENING TO INFILL FOR EACH BUILDING, SEE PLAN VIEW AND SECTION DETAILS FOR EACH BUILDING FOR CAVITY OPENING SIZE AND FOR INFILL REBAR REINFORCING REQUIRED.

NOTE 3: INFILL CAVITY WITH CONCRETE FLOWABLE FILL. PLACE FLOWABLE FILL IN 2'-0" MAXIMUM LIFTS. LOWER LIFT MUST BE SET (ABLE TO WALK ON WITHOUT LEAVING FOOT PRINTS) BEFORE UPPER LIFT CAN BE PLACED. WHEN INFILLING CAVITY WITH FLOWABLE FILL, IT IS NOT REQUIRED TO DRILL 1"Ø HOLES IN EXISTING CAVITY CONCRETE FLOOR.

ALTERNATE CAVITY INFILL WALL SECTION
1" = 1'-0"

B
V.01



CERTIFICATION

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

KYLE G. LACHINA

DATE: JANUARY 22, 2025 REGISTRATION NUMBER: 14458

MY REGISTRATION EXPIRES DECEMBER 31, 2025

CERTIFICATION COVERS SHEETS: V.01, V.02, V.03, V.04, V.05, V.06, V.07, V.08, V.09

DATE ISSUED:
JANUARY 22, 2025

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DESIGNED	REV	DESCRIPTION	DATE
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CITY OF MARSHALLTOWN, IOWA

MAIN STREET

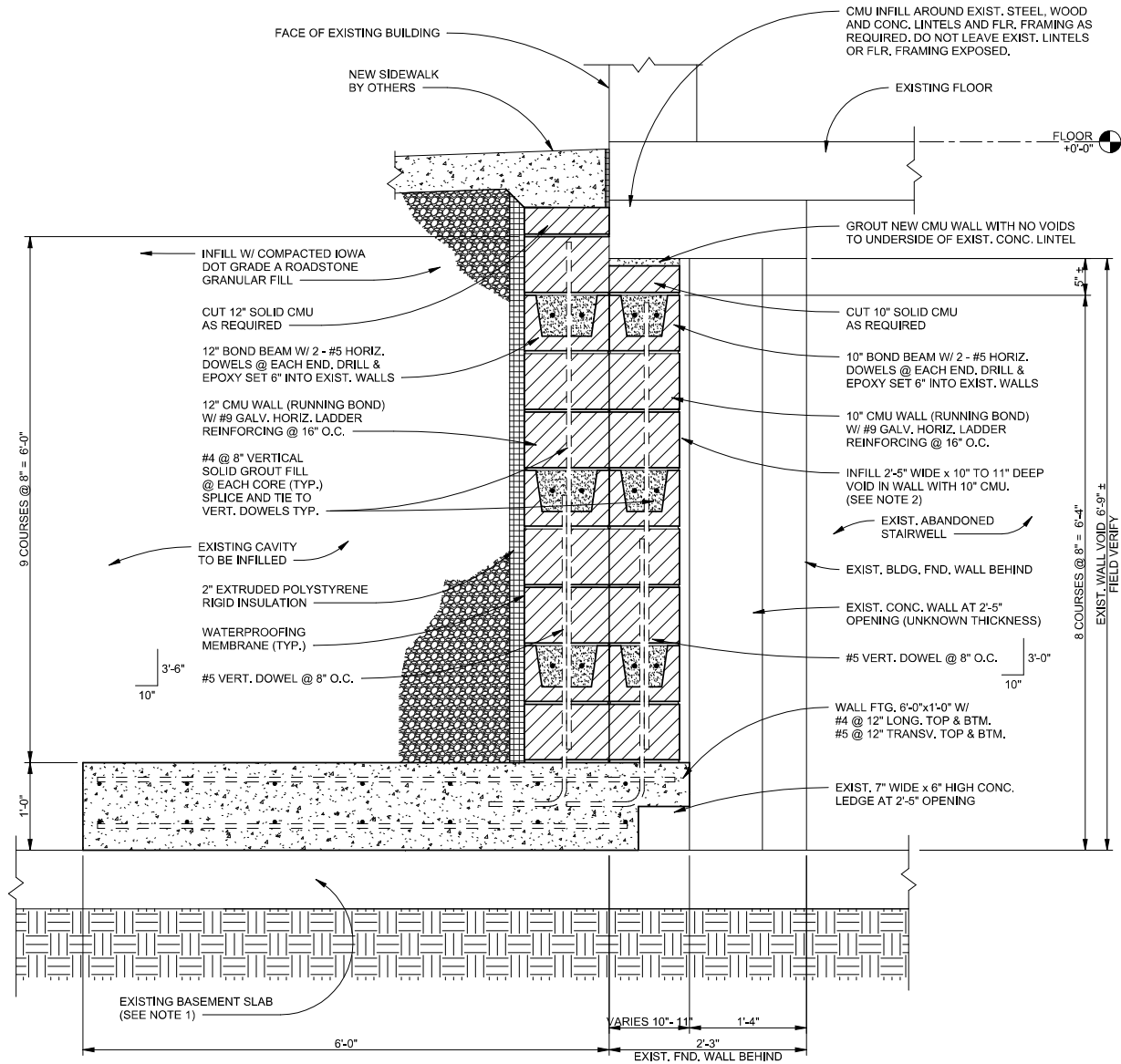
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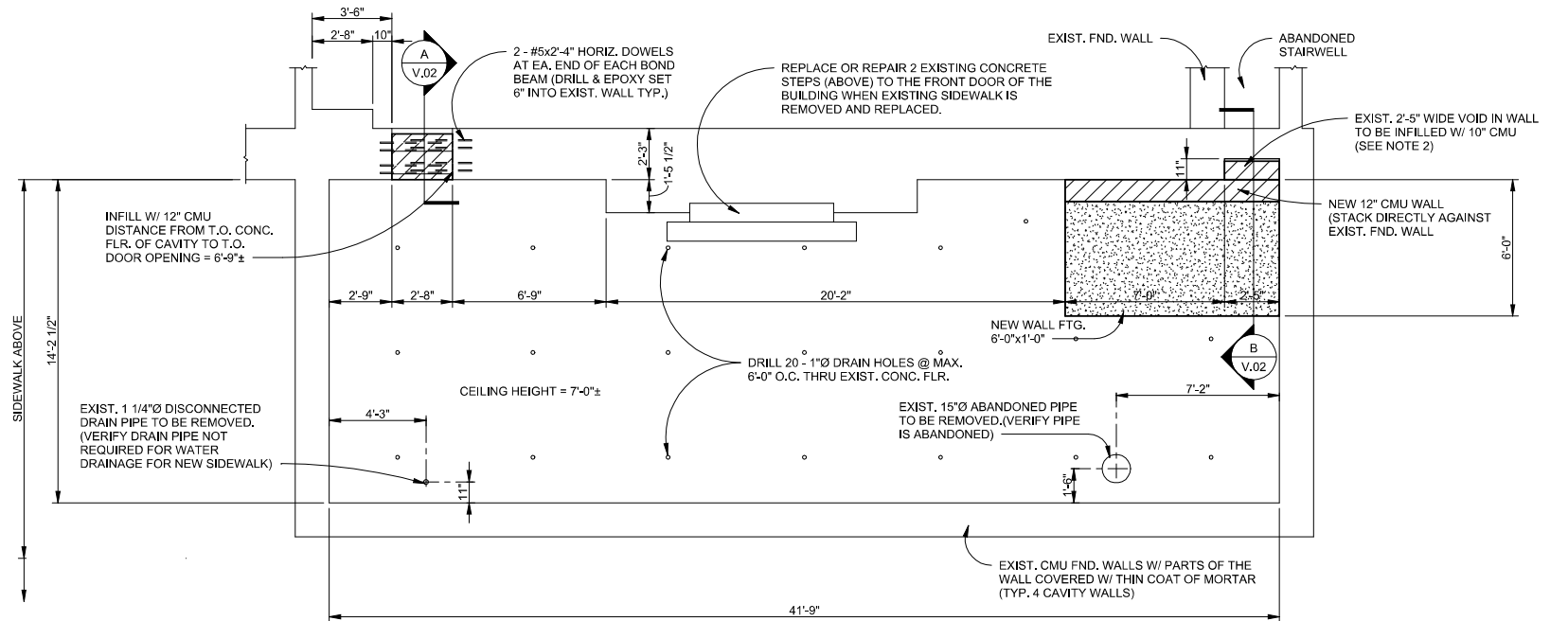
V.01

NOTE #1:
REMOVE ALL BROKEN AND LOOSE CONCRETE, WOOD, DEBRIS, ETC., AT 2'-5" WIDE VOID IN WALL AND WHERE NEW WALL FOOTING WILL BE INSTALLED. IF BASEMENT FLOOR IS ONLY DIRT WHERE NEW WALL FOOTING WILL BE INSTALLED, AND THE DIRT IS SOFT, REMOVE SOFT DIRT AND INSTALL MINIMUM 6" COMPACTED IOWA DOT CLASS A ROADSTONE

NOTE #2:
THE EXISTING 2'-5" WIDE x 10" TO 11" DEEP WALL VOID IN THE BASEMENT WALL IS WHERE AN OPENING IN THE BASEMENT WALL USED TO BE FOR ACCESS TO A STAIRCASE TO GROUND LEVEL UNDER THE ALLEY. THE STAIRCASE HAS BEEN ABANDONED FOR MANY YEARS. THE EXISTING 2'-5" WIDE OPENING IN THE BASEMENT WALL WAS CLOSED WITH A CONCRETE WALL WITH AN UNKNOWN THICKNESS, THIS EXISTING CONCRETE WALL IS BADLY CRACKED.

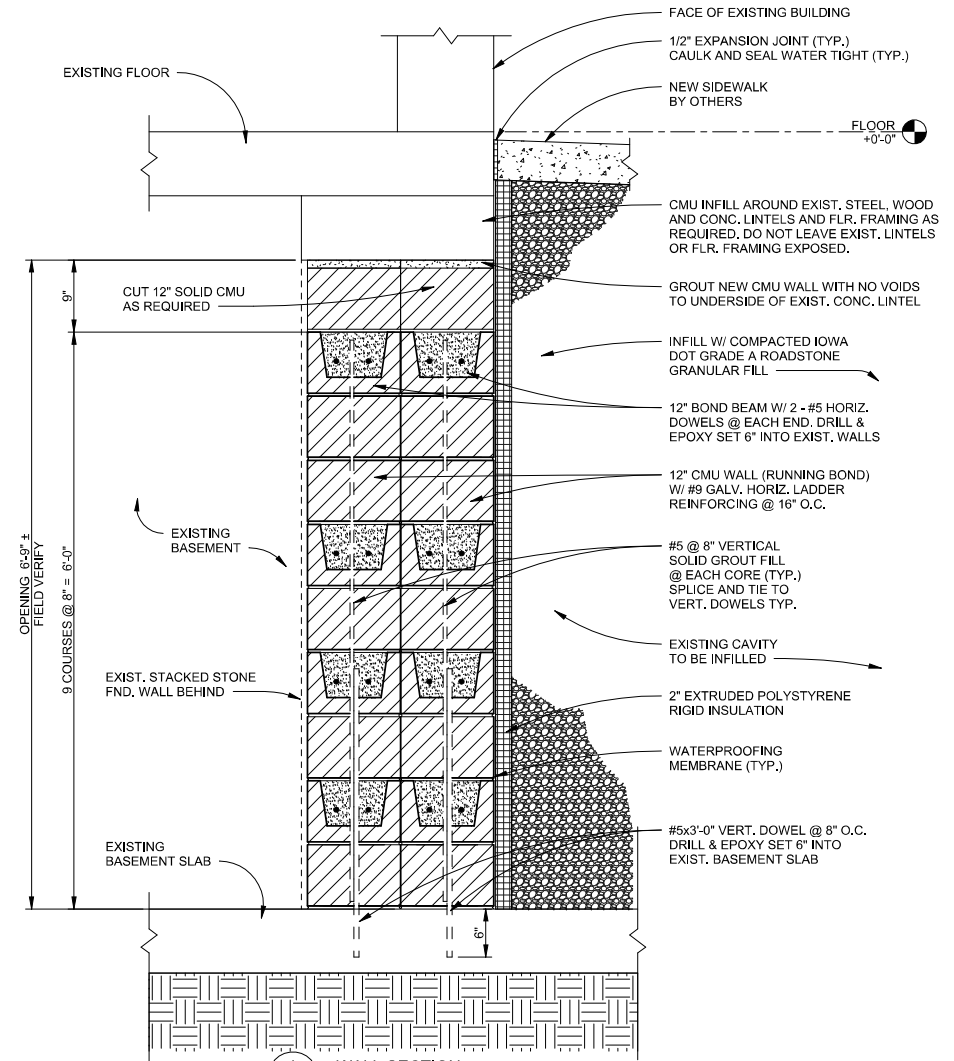


B
V.02
WALL SECTION
1" = 1'-0"



1
V.02
FOUNDATION PLAN
1/4" = 1'-0"

NOTE: EXISTING CONC. SIDEWALK/CAVITY CEILING IS SUPPORTED BY CURVED BENT CORRUGATED METAL. THE BENT METAL IS SUPPORTED BY W BEAMS SPACES @ 4'-6" O.C. RUNNING EAST-WEST. EXISTING SIDEWALK AND SIDEWALK SUPPORTS TO BE REMOVED.



A
V.02
WALL SECTION
1" = 1'-0"

DATE ISSUED:
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CLIENT PROJ. NO.			
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CITY OF MARSHALLTOWN, IOWA
MAIN STREET
19 S. CENTER STREET - BDH BUILDING

SHEET
V.02

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BOLTON & MENK, INC. 2024.11.14 - Structural Engineers 129221, C. BORDO.dwg 9/13/2016 11:35:06 AM
SEPC PROJECT # 24028

DATE ISSUED:
JANUARY 22, 2025

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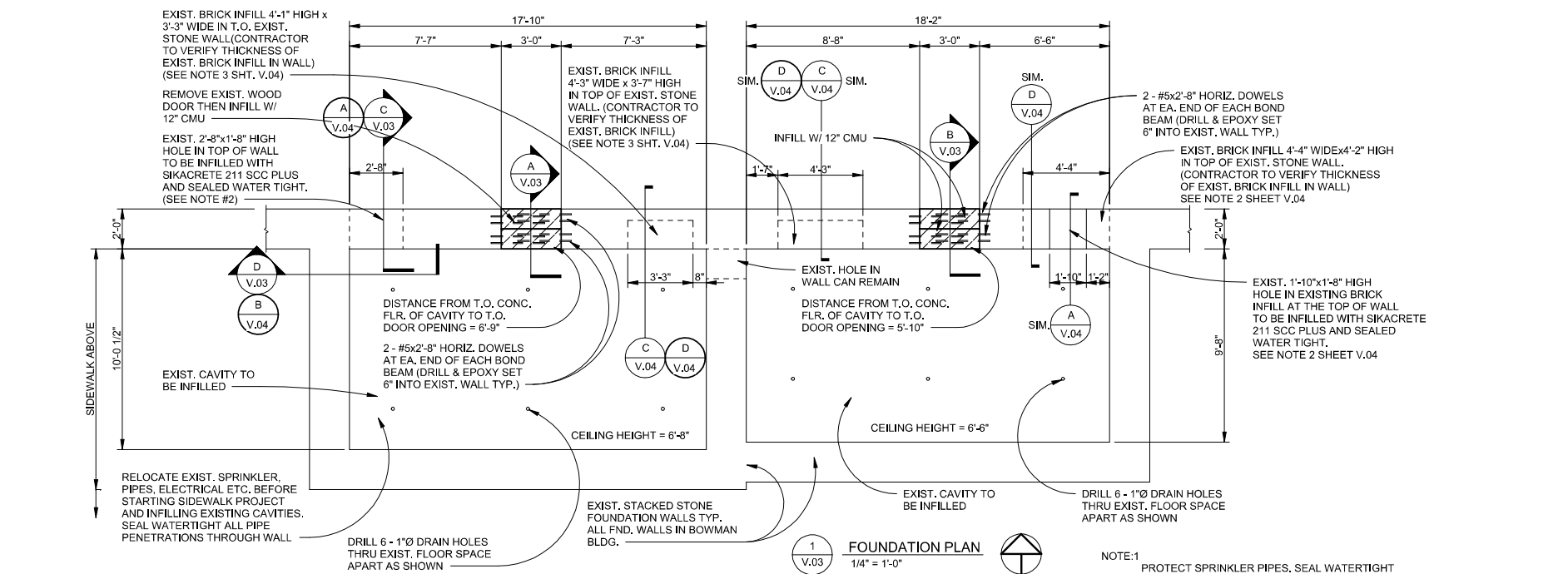


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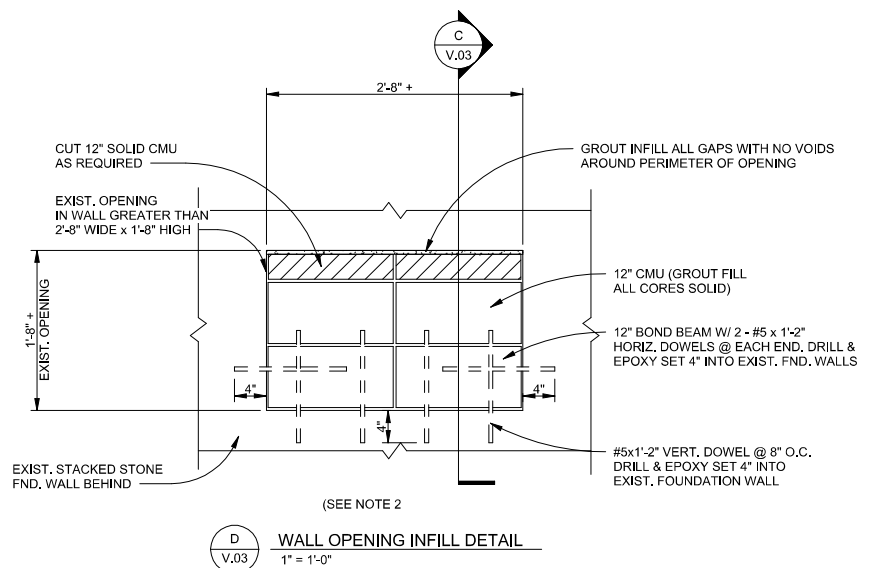
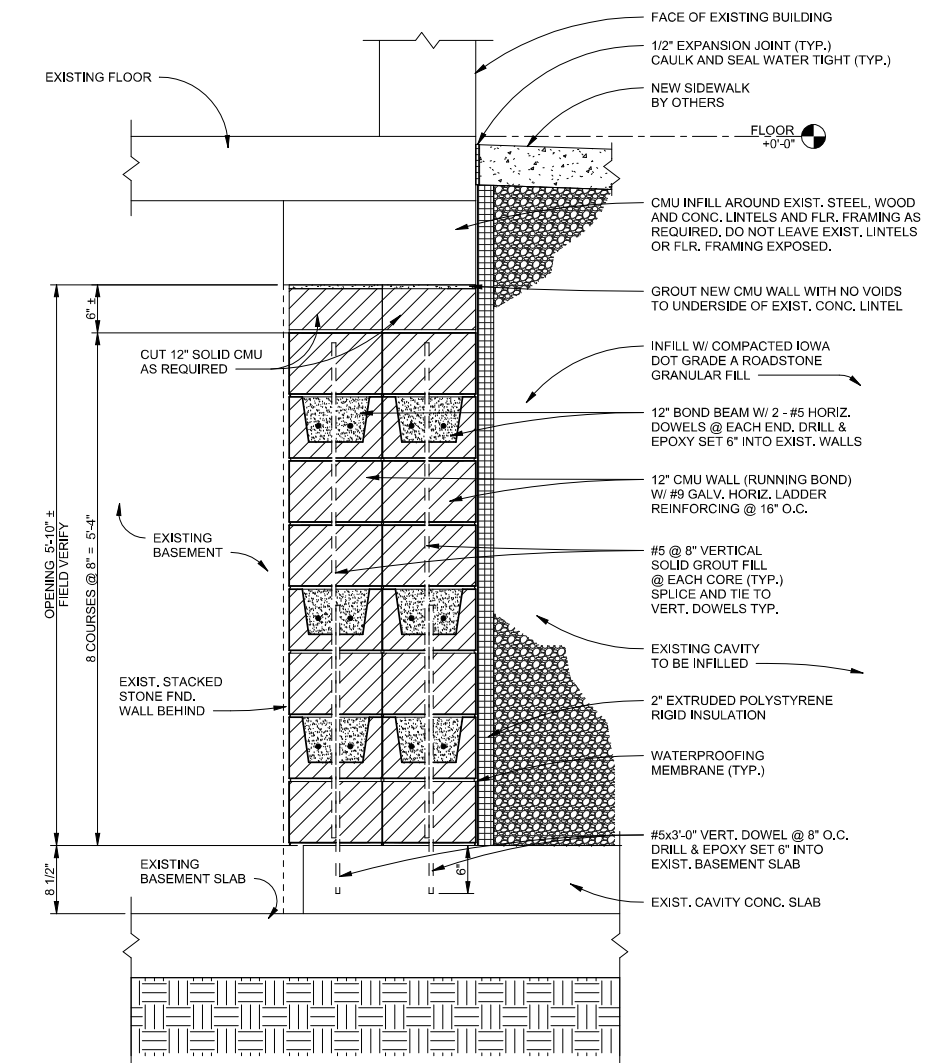
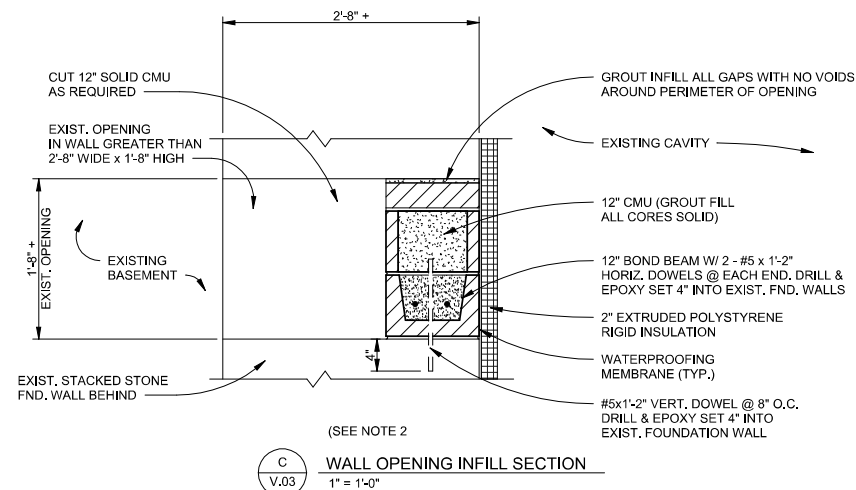
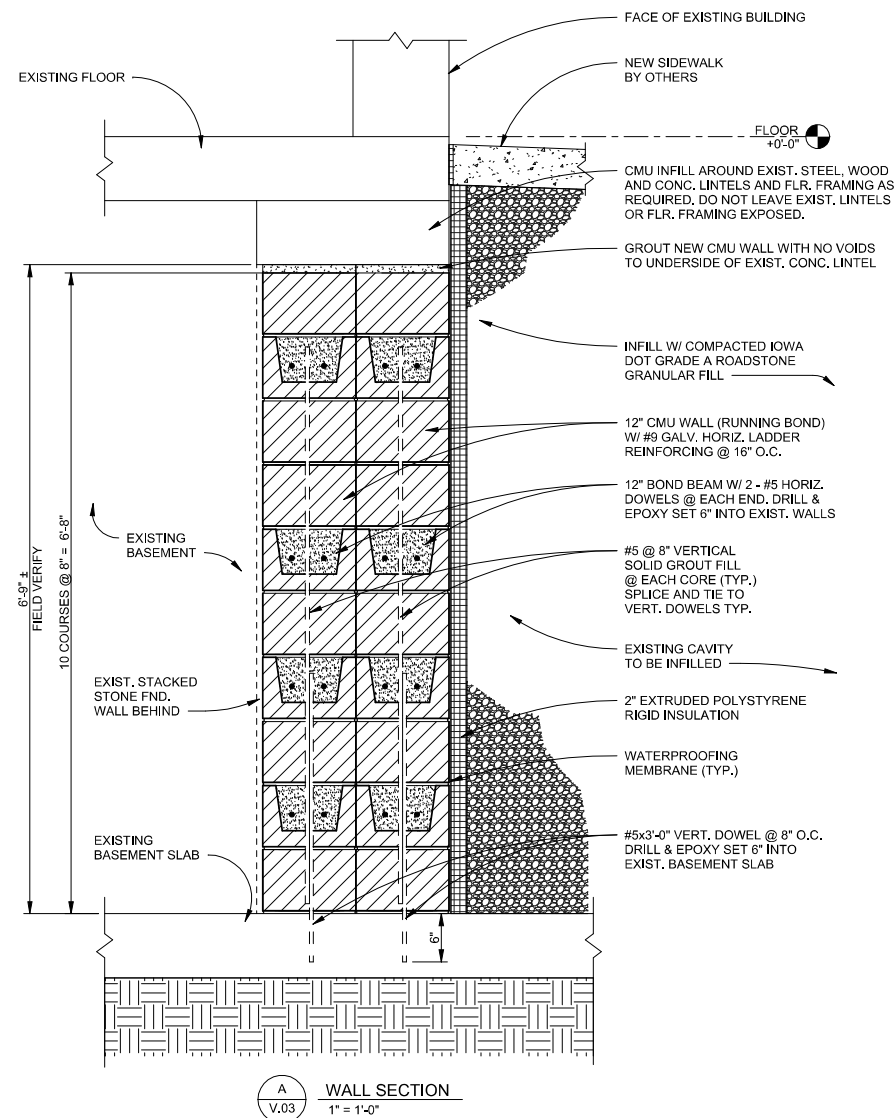
CITY OF MARSHALLTOWN, IOWA
MAIN STREET
24 E. MAIN STREET - BOWMAN BUILDING

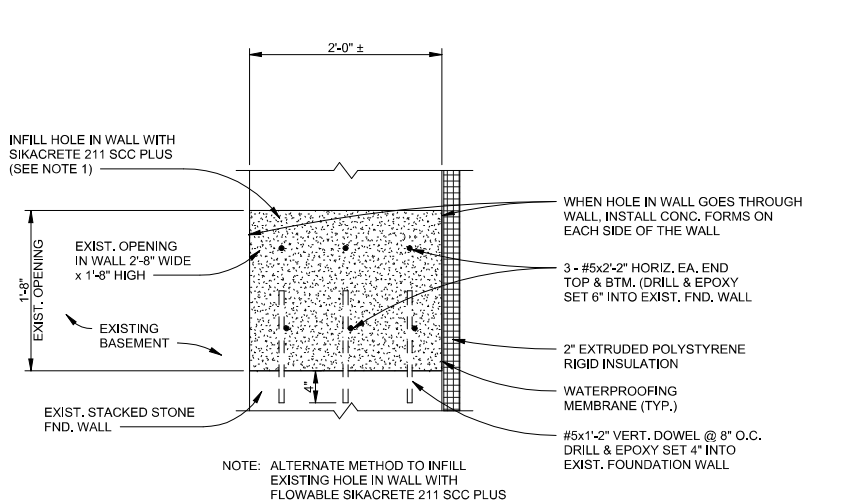
SHEET
V.03



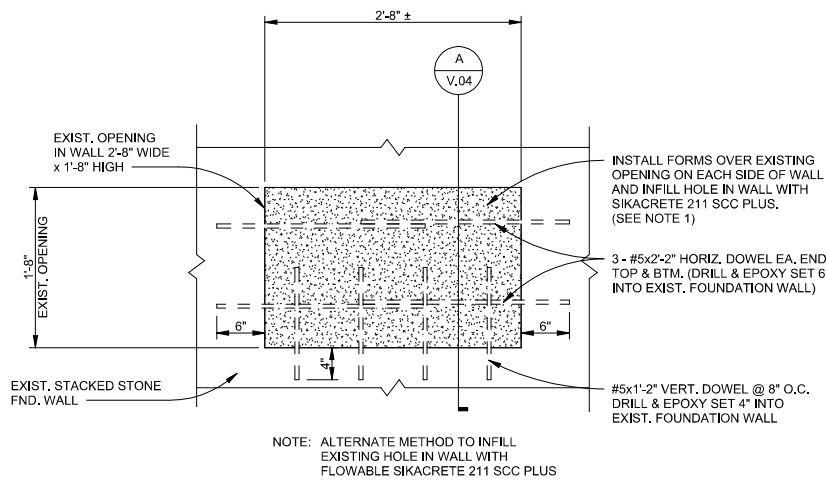
NOTE: 1
PROTECT SPRINKLER PIPES, SEAL WATERTIGHT WHERE ALL PIPES GO THROUGH THE CAVITY WALL.

NOTE: 2
FOR EXISTING HOLES IN BASEMENT FOUNDATION WALLS BETWEEN THE BASEMENT AND THE CAVITY THAT NEEDS TO BE INFILLED, IF THE EXISTING HOLE IS 2'-8" WIDE OR 1'-8" HIGH OR SMALLER, USE SIKACRETE 211 SCC PLUS TO FILL HOLE. IF EXISTING HOLE IS LARGER THAN 2'-8" WIDE AND 1'-8" HIGH, CAN INFILL HOLE WITH 12" CMU OR SIKACRETE 211 SCC PLUS. FOR THE WALL OPENING THRU THE WALL IN THE WEST CAVITY, AND THE WALL OPENING THRU THE WALL IN THE EAST CAVITY INFILL OPENING WITH SIKACRETE 211 SCC PLUS, AS SHOWN ON DETAIL A/V.04 AND DETAIL B/V.04.

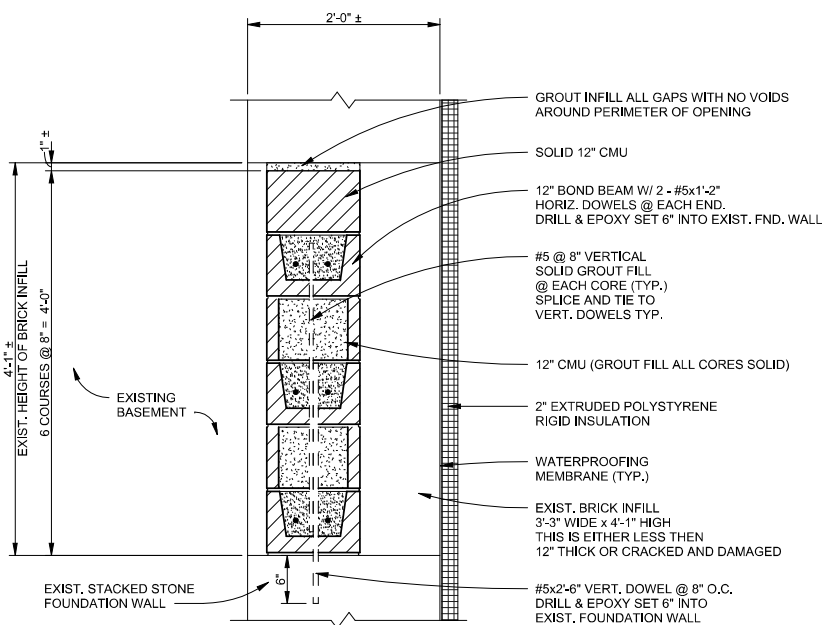




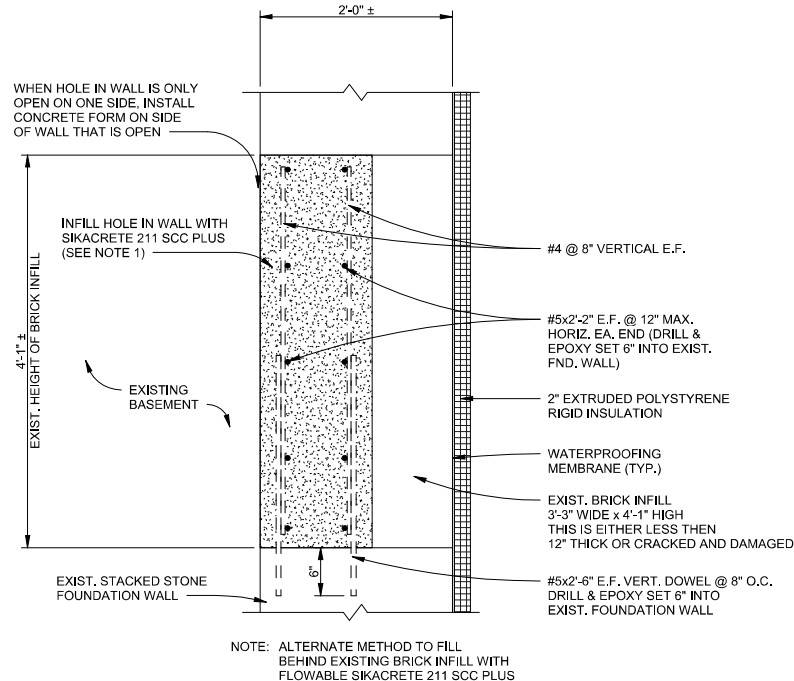
A
V.04
WALL OPENING INFILL SECTION
1" = 1'-0"



B
V.04
WALL OPENING INFILL DETAIL
1" = 1'-0"



C
V.04
WALL SECTION 12" CMU INFILL
1" = 1'-0"
(WHERE EXISTING BRICK INFILL IS INADEQUATE)



NOTE: FOR EAST CAVITY, FOR FAR EAST OPENING THRU WALL IF THE THICKNESS OF THE EXISTING BRICK IS LESS THAN 17" THICK, INFILL BEHIND THE BRICK WITH SIKACRETE 211 SCC PLUS.

D
V.04
WALL SECTION 12" CMU INFILL ALT.
1" = 1'-0"
(WHERE EXISTING BRICK INFILL IS INADEQUATE)

NOTE 1: STEPS TO INFILL EXISTING HOLE IN CAVITY WALL WITH SIKACRETE 211 SCC PLUS.

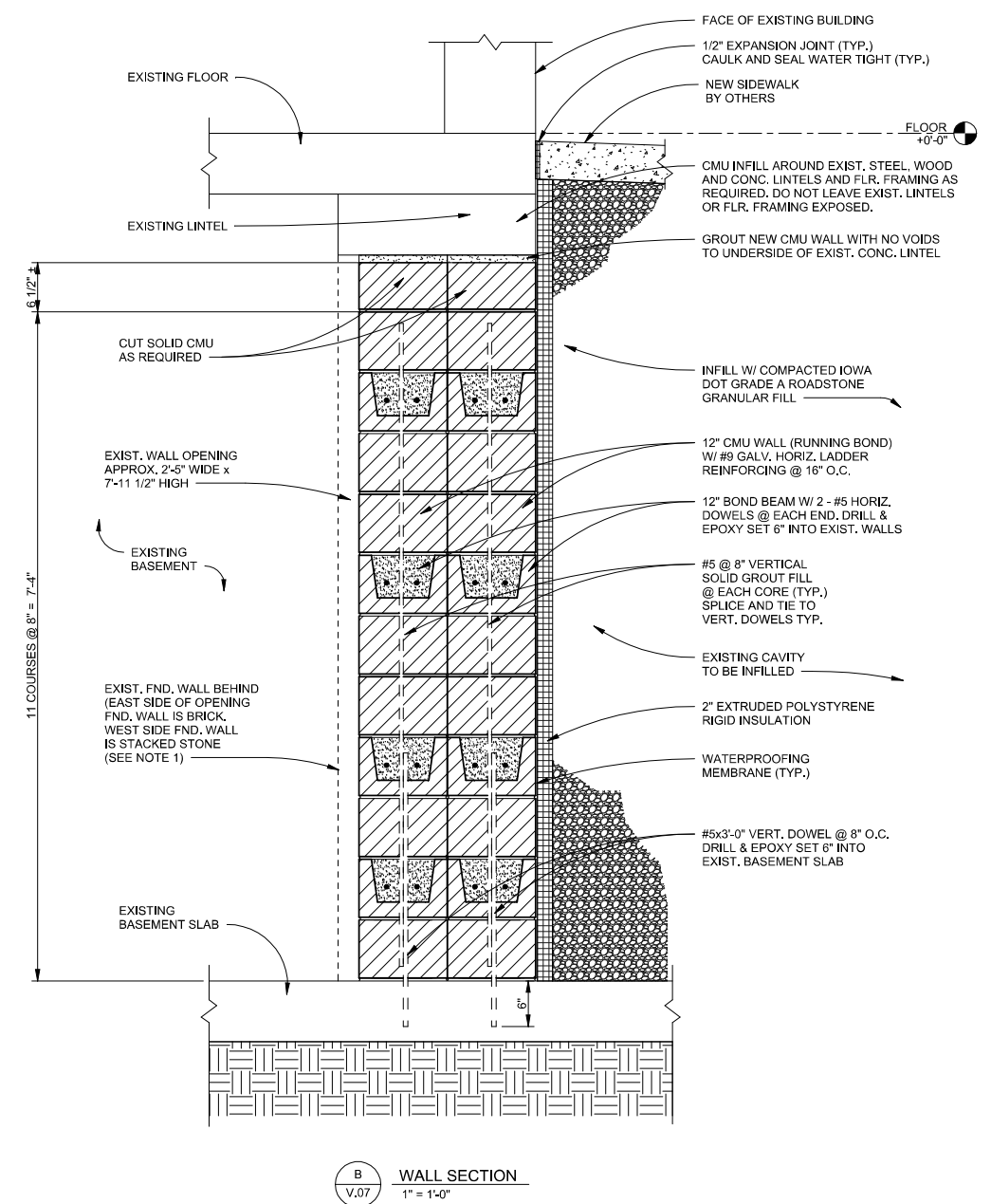
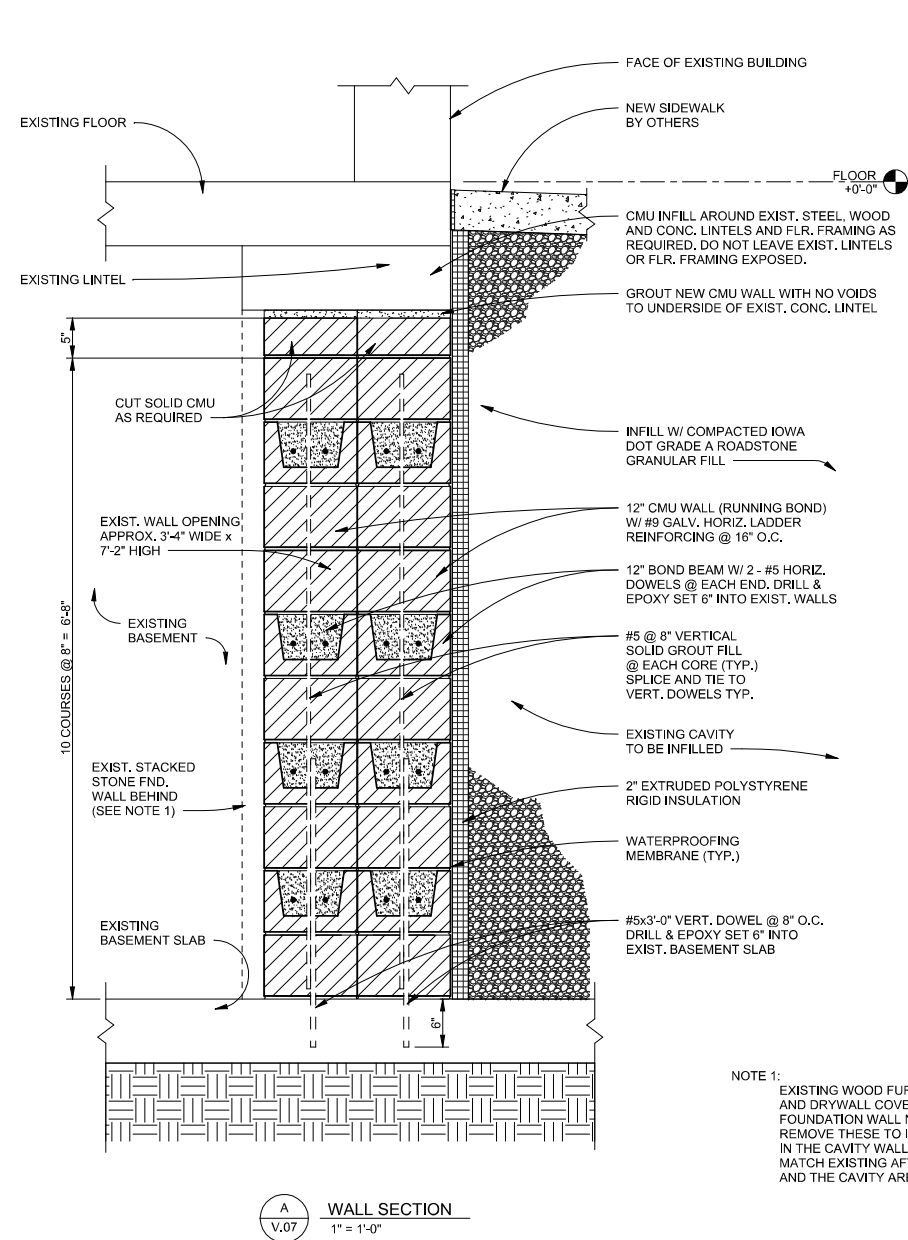
- WHERE THE HOLE IN THE WALL GOES THROUGH THE WALL, ON THE FACE OF THE WALL, AROUND THE PERIMETER OF THE OPENING THROUGH THE WALL, ON BOTH SIDES OF THE WALL, REMOVE ALL LOOSE STONES, MORTAR, DIRT, ETC., AND APPLY A HEAVY COAT OF CEMENT MORTAR FILLING ALL VOIDS AND CRACKS TO HAVE A LEVEL SMOOTH SURFACE, WHERE THE HOLE IN THE WALL IS ONLY OPEN ON ONE SIDE OF THE WALL, REMOVE ALL LOOSE STONES, MORTAR, DIRT, ETC., AND APPLY A HEAVY COAT OF CEMENT MORTAR FILLING ALL VOIDS AND CRACKS TO HAVE A LEVEL, SMOOTH SURFACE ON THE SIDE OF THE WALL THAT HAS THE OPENING. ON THE FACE OF ALL THE STACKED STONE WALLS, ON THE CAVITY SIDE, INCLUDING AROUND THE PERIMETER OF THE WALL OPENING, REMOVE ALL LOOSE STONES, MORTAR, DIRT, ETC. APPLY A HEAVY COAT OF CEMENT MORTAR FILLING ALL VOIDS AND CRACKS BETWEEN THE STACKED STONES. APPLY THE CEMENT MORTAR SO THE OUTSIDE SURFACE IS LEVEL WITHOUT VOIDS. (SEE CMU INFILL NOTES ON SHEET V.01)
- INSTALL REBAR INSIDE WALL OPENINGS AS SHOWN ON DETAIL.
- SATURATE THE INSIDE SURFACE OF THE HOLE WITH CLEAN WATER TO SATURATE SURFACE DRY (SSD) WITH NO STANDING WATER.
- WHERE THE HOLE IN THE WALL GOES THROUGH THE WALL, INSTALL FORMS OVER EXISTING WALL OPENING ON EACH SIDE OF THE WALL, WHERE THE HOLE IN THE WALL IS ONLY OPEN ON ONE SIDE OF THE WALL INSTALL WALL FORM ON THE SIDE OF THE WALL THAT HAS THE OPENING. FORMS MUST BE INSTALLED AGAINST THE WALL AIR TIGHT.
- PUMP SIKACRETE 211 SCC PLUS, OR EQUAL, UNDER PRESSURE THROUGH A HOLE IN THE FORM INTO THE HOLE IN THE WALL. INSTALL THE SIKACRETE 211 SCC PLUS AS NOTED IN THE SIKACRETE 211 SCC PLUS PRODUCT DATA SHEET AND WET CURE AFTER THE FORMS ARE REMOVED. APPLY THE WATERPROOFING MEMBRANE TO THE CAVITY WALL AND OVER THE INFILLED HOLE IN THE WALL AT THE SAME TIME AFTER THE INFILL CONCRETE HAS CURED.
- IF HOLE IN WALL TO INFILL IS MUCH LARGER, USE SIKACRETE 360 SCC OR EQUAL.

NOTE 2:

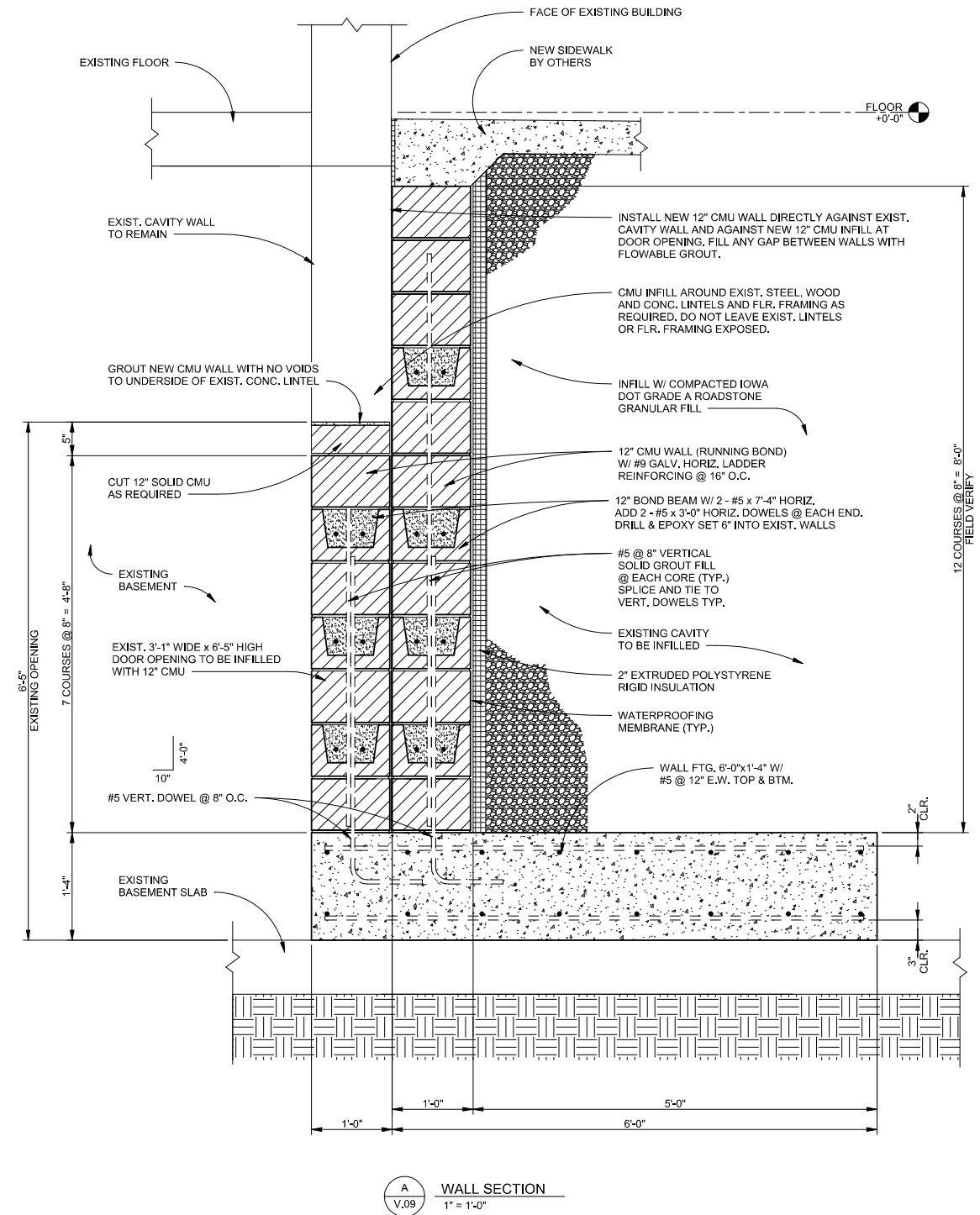
IF EXISTING BRICK INFILL IN FOUNDATION WALL ON FAR EAST SIDE OF EAST CAVITY IS LESS THAN 17" THICK, OR IS CRACKED OR DAMAGED, THEN PUMP BEHIND BRICK INFILL FLOWABLE SIKACRETE 211 SCC PLUS SIMILAR TO DETAIL D/V.04. TO INFILL EXISTING 1'-10" WIDE x 1'-8" HIGH HOLE IN EXISTING BRICK INFILL, PUMP FLOWABLE SIKACRETE 211 SCC PLUS INTO HOLE SIMILAR TO DETAIL A/V.04. IF BOTH INFILLS ARE REQUIRED, PUMP INFILL THE SIKACRETE 211 SCC PLUS AT THE SAME TIME FOR BOTH. BEFORE PUMPING SIKACRETE 211 SCC PLUS INTO THE HOLE IN THE WALL, INSTALL REBAR IN THE OPENING SIM. TO DETAIL A/V.04 AND DETAIL D/V.04.

NOTE 3:

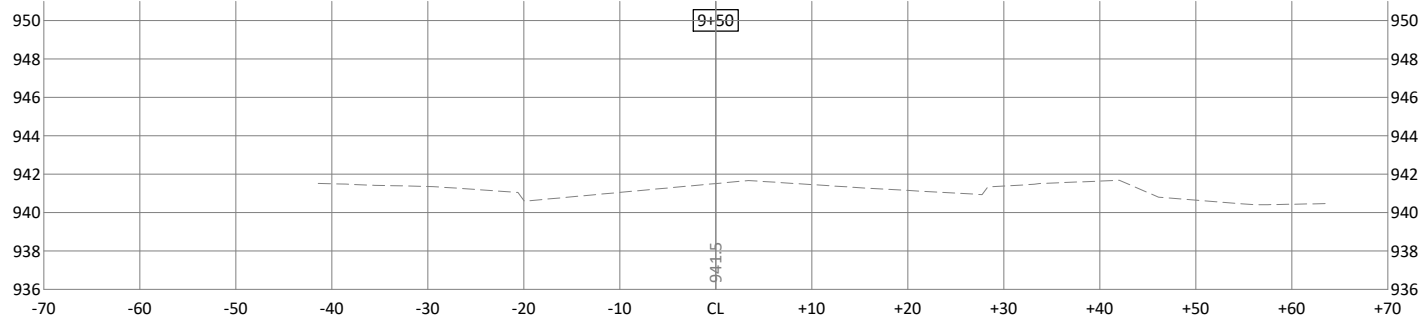
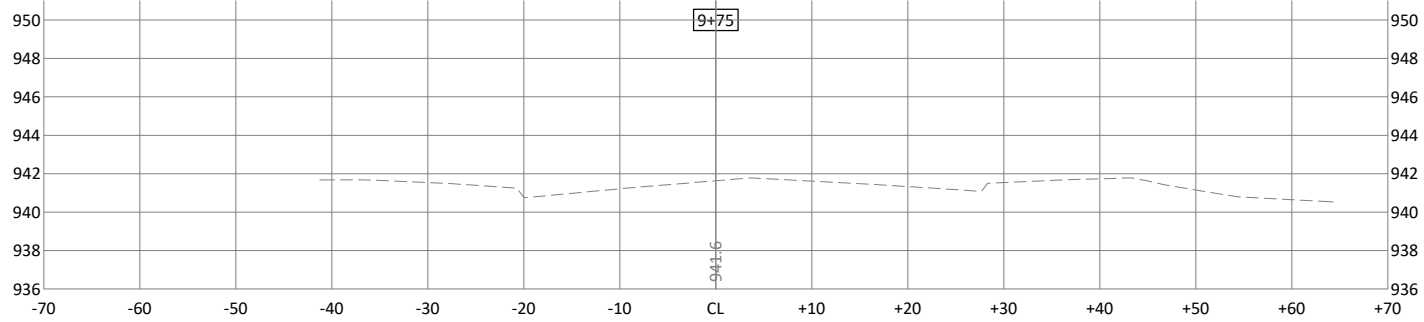
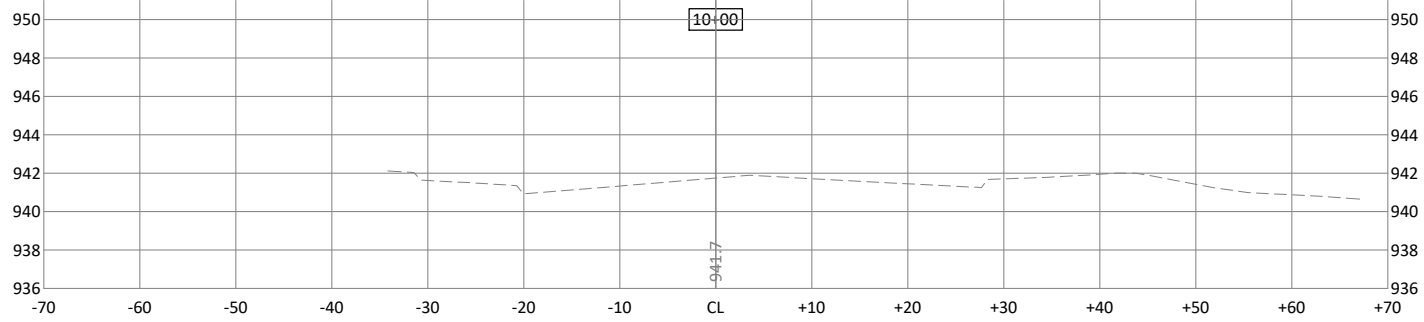
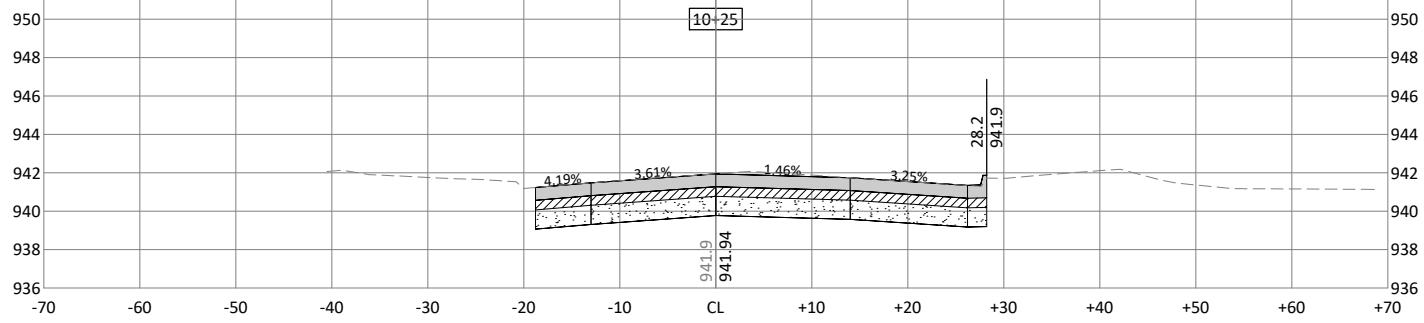
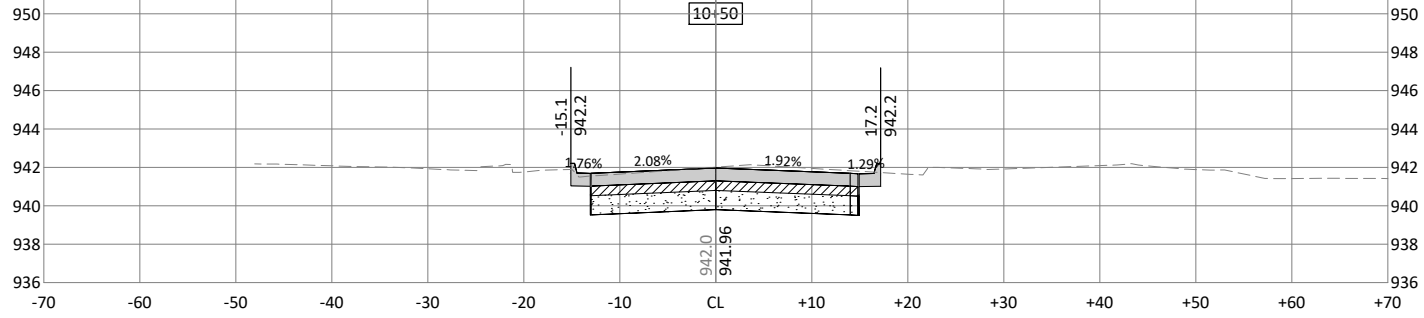
CONTRACTOR MUST VERIFY EXISTING BRICK INFILL THICKNESS IN STACKED STONE CAVITY WALL BY REMOVING EXISTING SHEETROCK ON NORTH FACE OF THE CAVITY WALL THAT COVERS THE BRICK INFILL. IF THE EXISTING BRICK INFILL IN THE STACKED STONE WALL IS LESS THAN 12" THICK, OR IS CRACKED AND DAMAGED, INFILL NEXT TO THE EXISTING BRICK INFILL WITH 12" CMU (SEE DETAIL C/V.04) OR INFILL WITH FLOWABLE SIKACRETE 211 SCC PLUS (SEE DETAIL D/V.04) REMOVED SHEETROCK, WOOD WALL OR WOOD FURRING STRIPS, AND VAPOR BARRIER MUST BE REPLACED TO MATCH EXISTING SHEETROCK WALL AFTER THE CAVITY HAS BEEN FILLED.



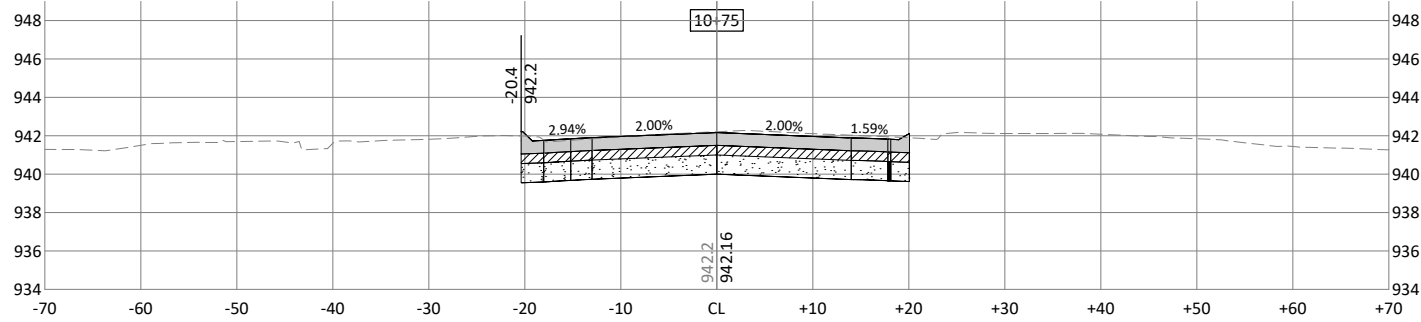
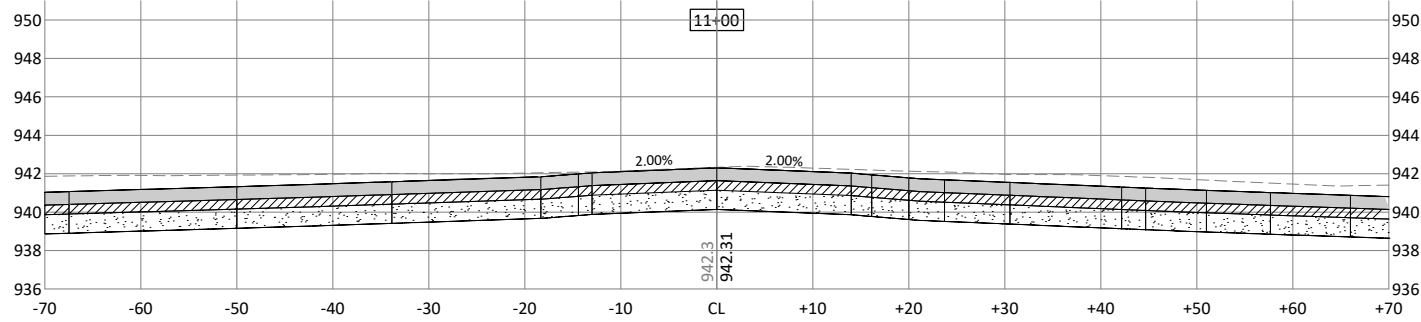
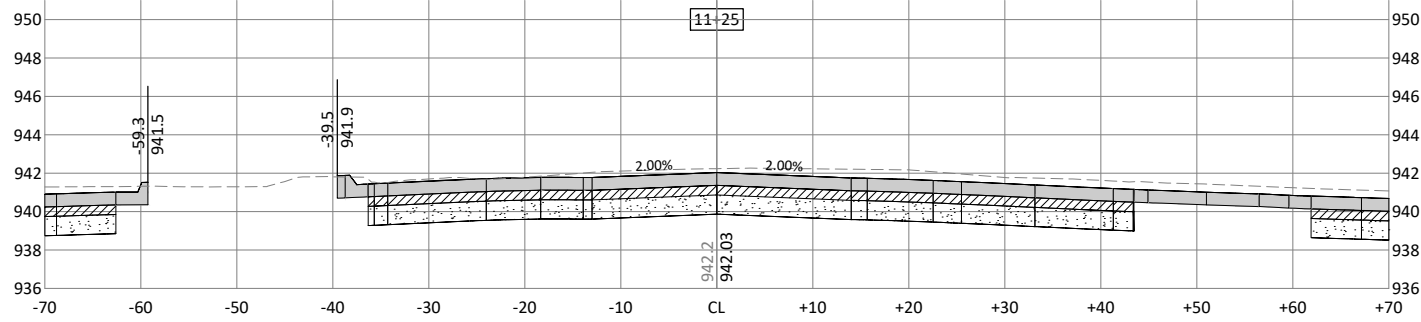
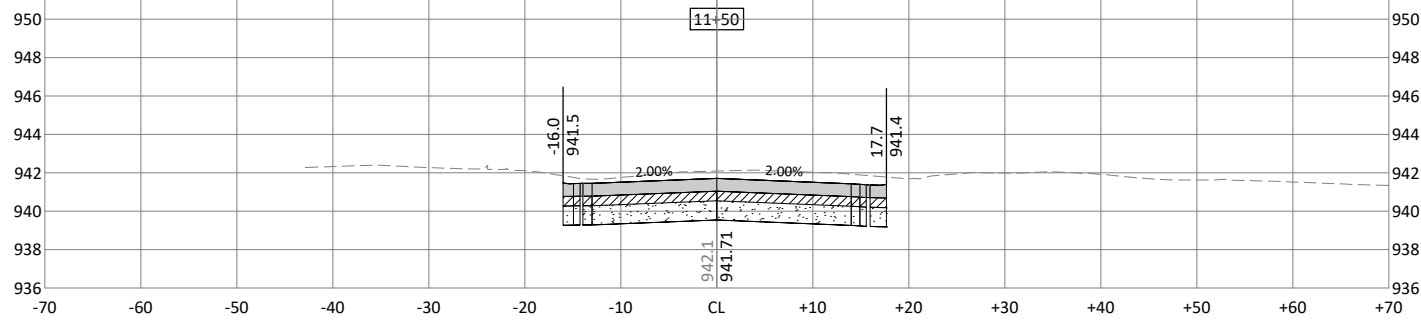
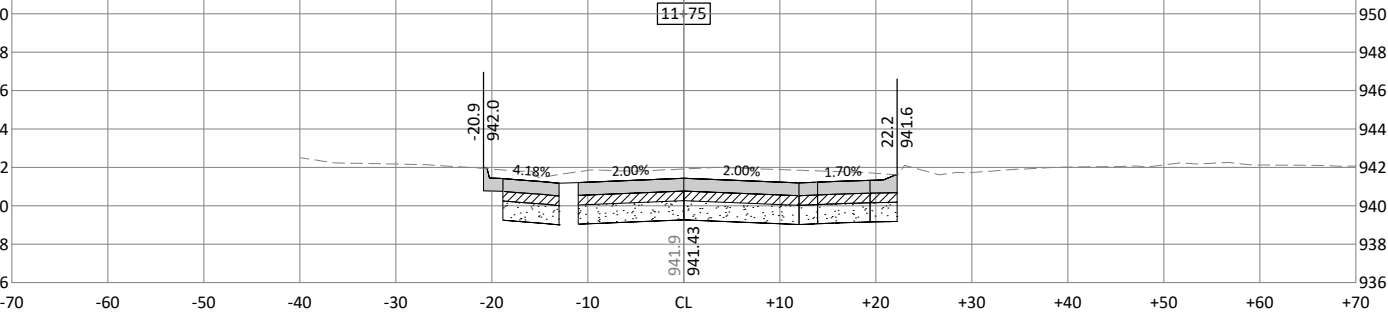
NOTE 1:
EXISTING WOOD FURRING, VAPOR BARRIER,
AND DRYWALL COVERING EXISTING BASEMENT
FOUNDATION WALL NOT SHOWN FOR CLARITY.
REMOVE THESE TO INFILL EXISTING OPENINGS
IN THE CAVITY WALL AND REPLACE THEM TO
MATCH EXISTING AFTER THE CAVITY OPENING
AND THE CAVITY ARE INFILLED.



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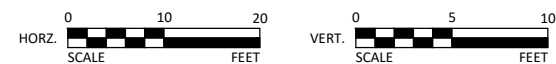
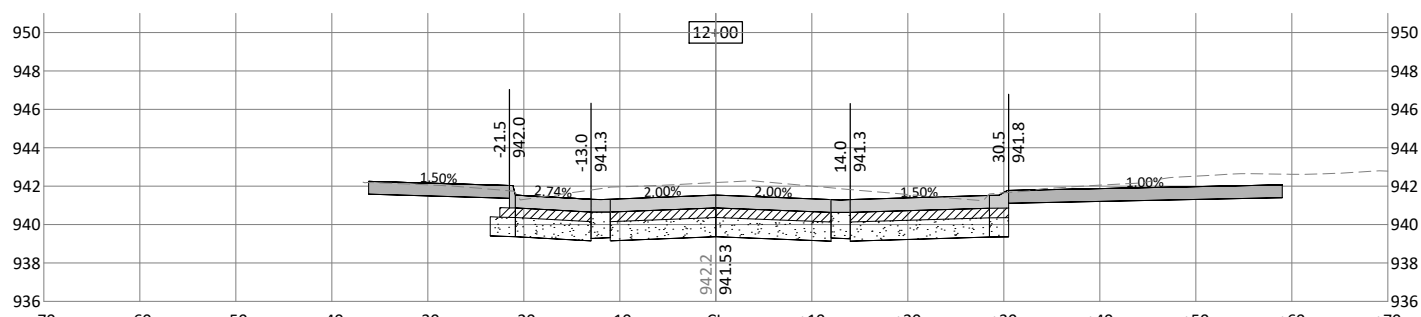
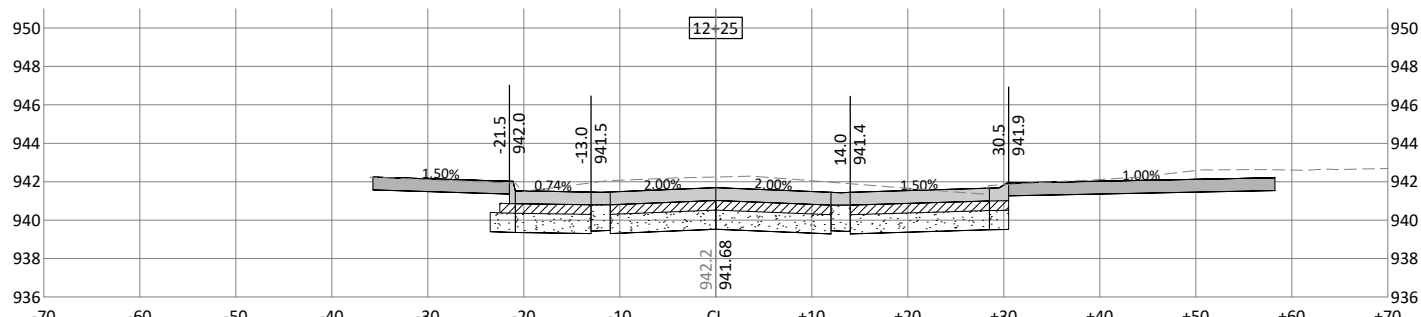
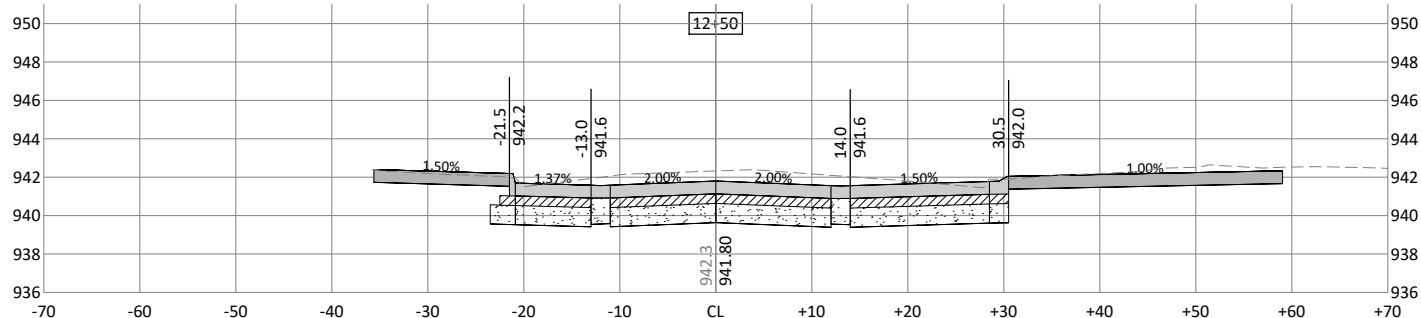
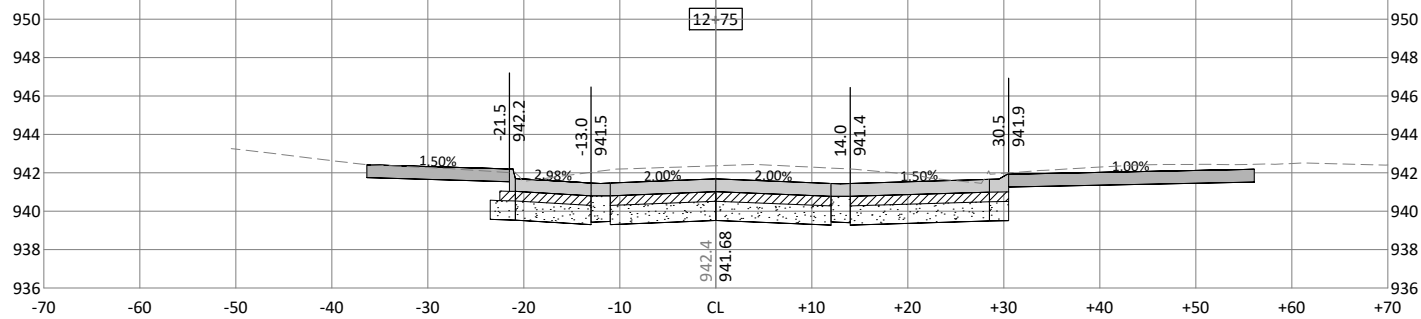
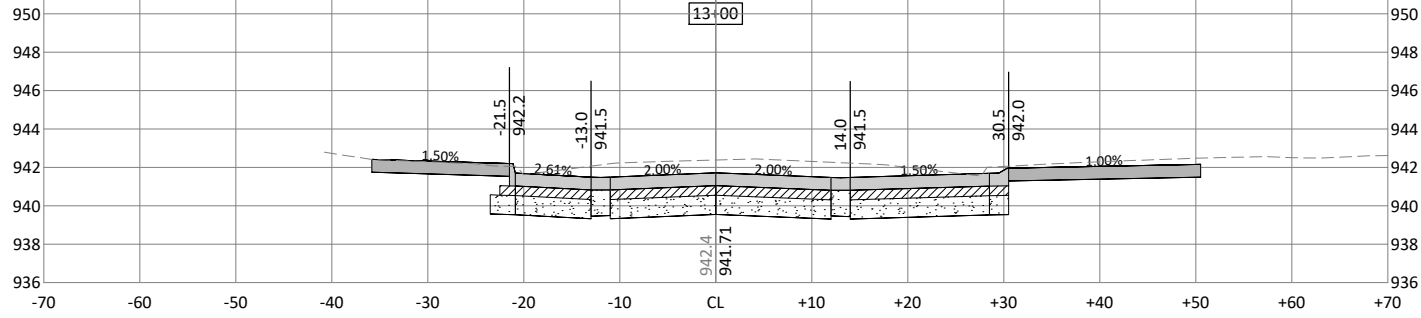
MAIN STREET RECONSTRUCTION

MAIN STREET CROSS SECTIONS

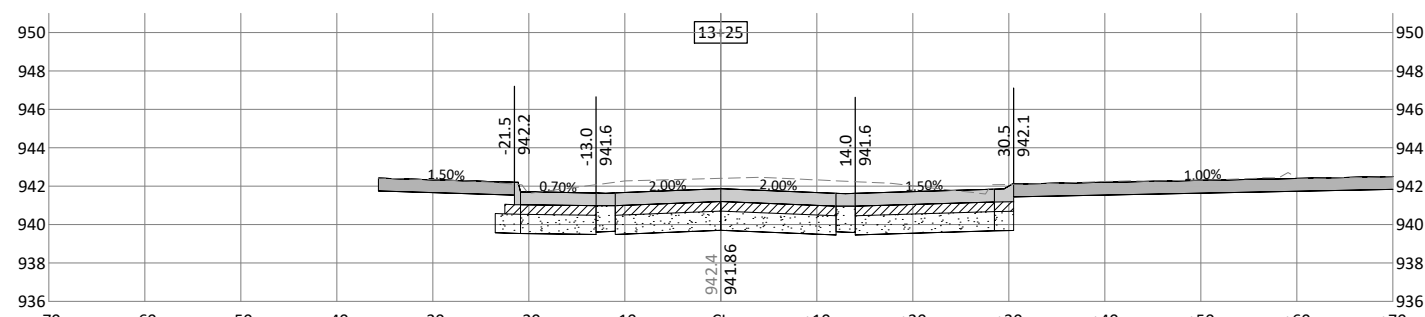
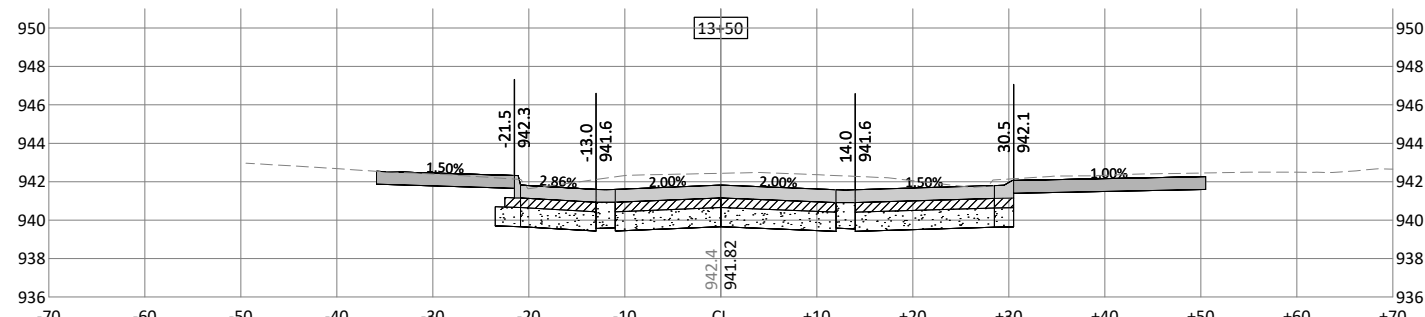
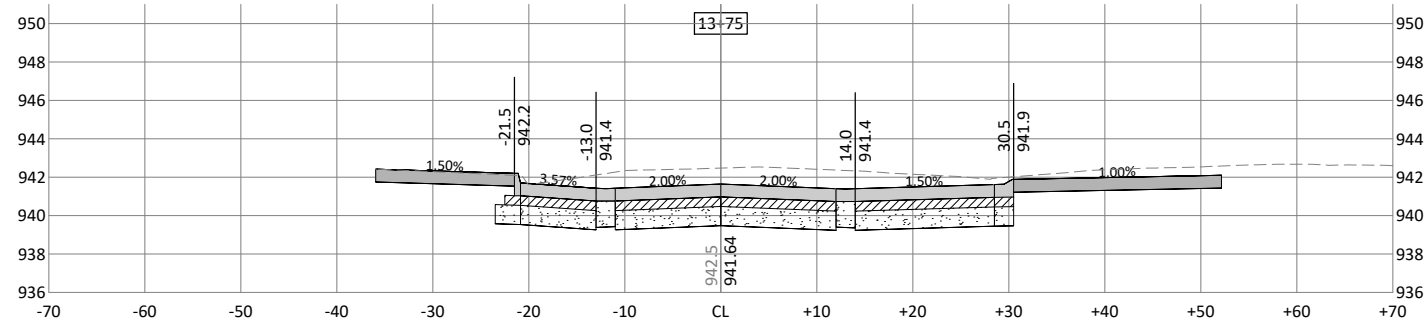
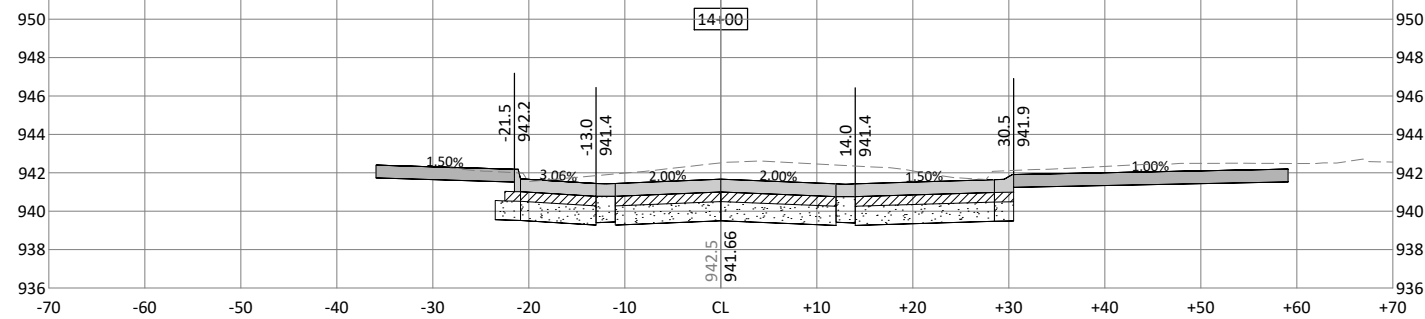
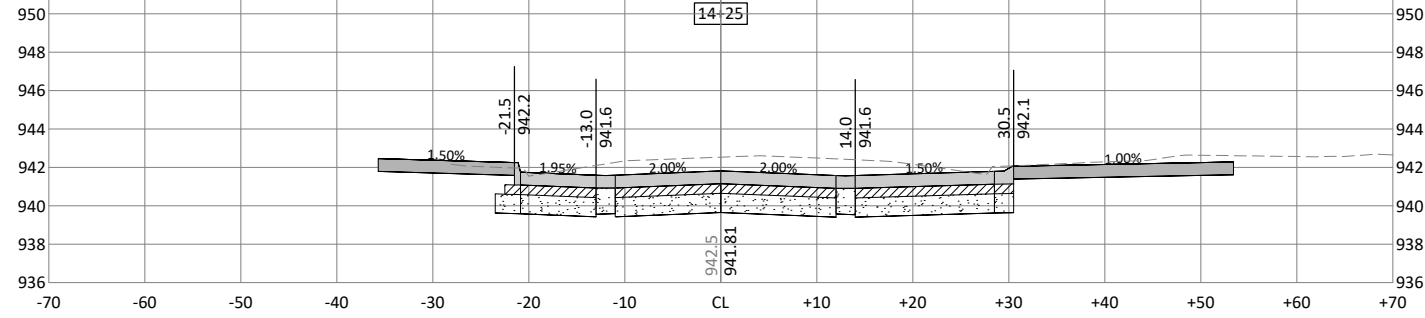
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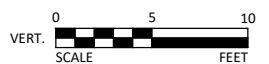
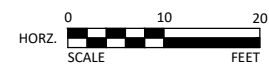
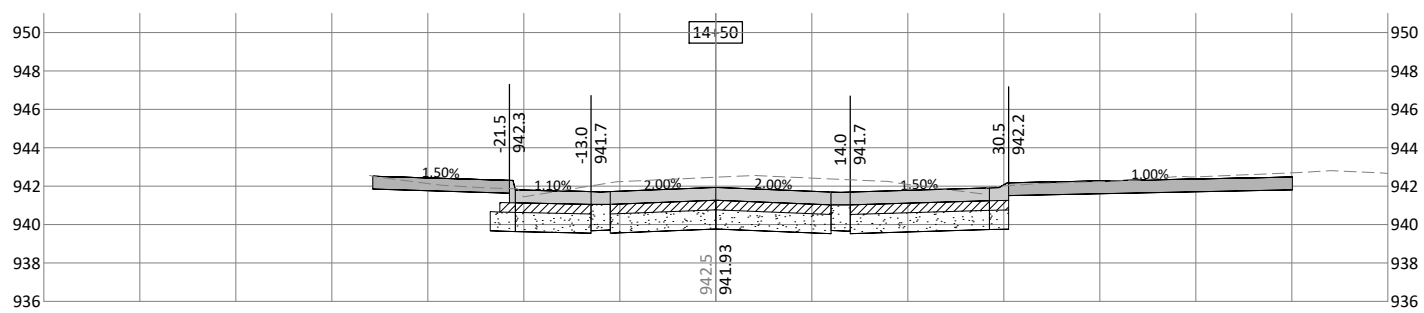
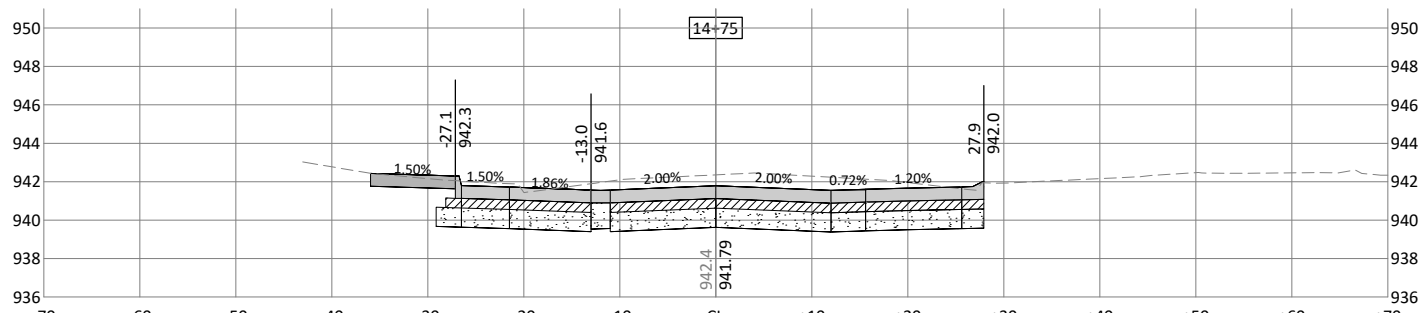
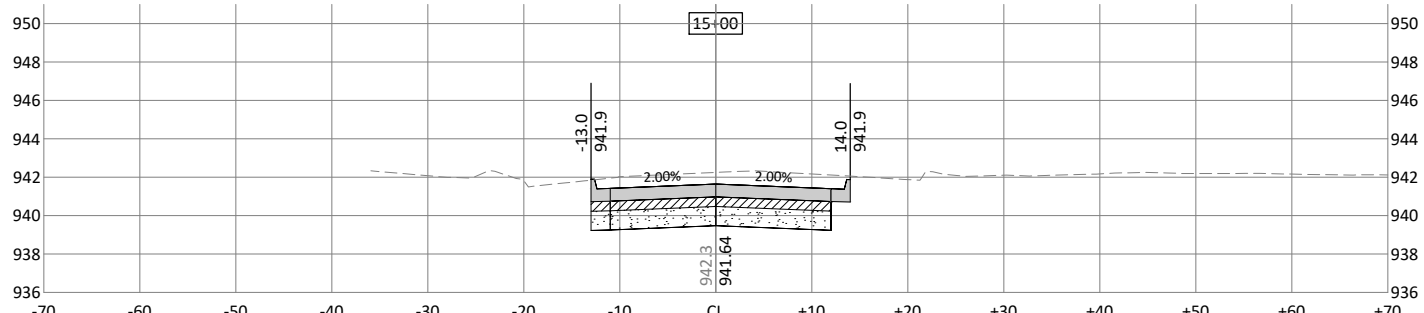
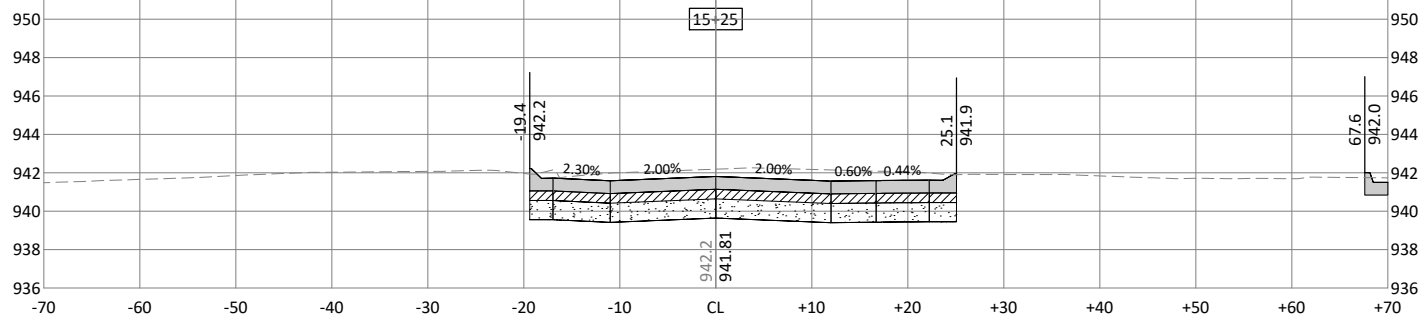
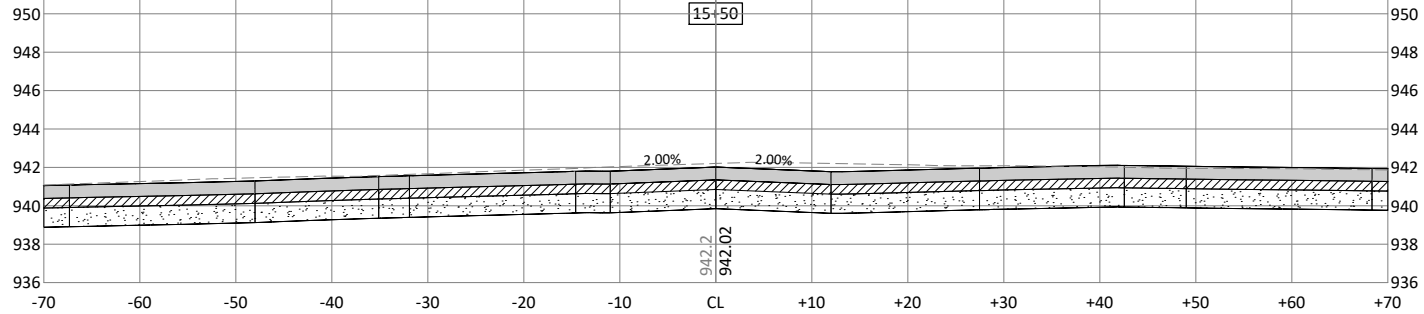


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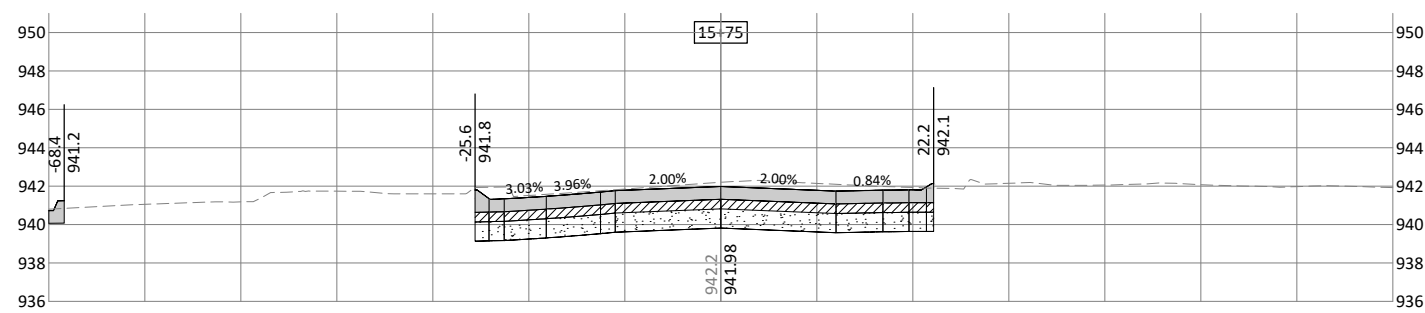
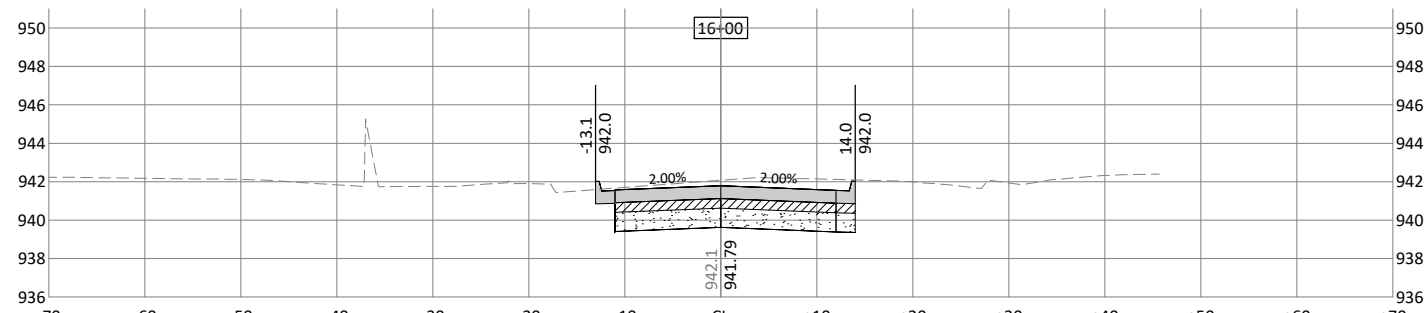
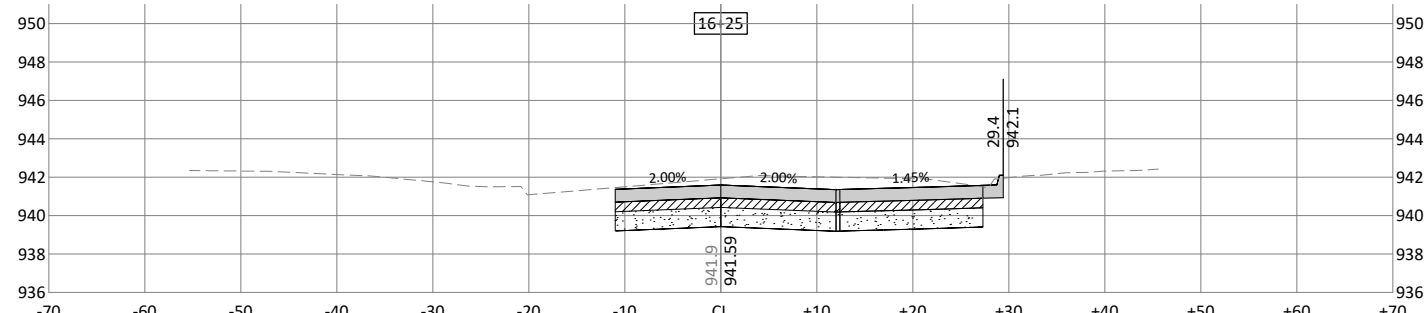
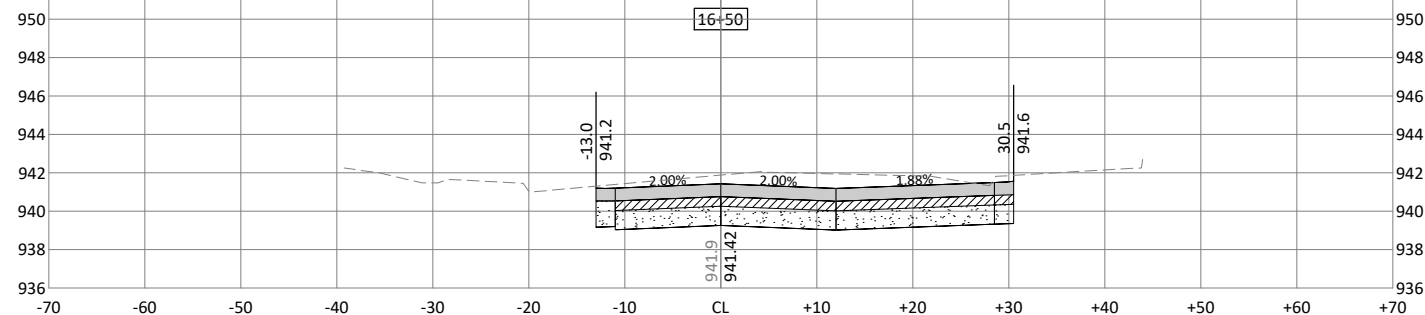
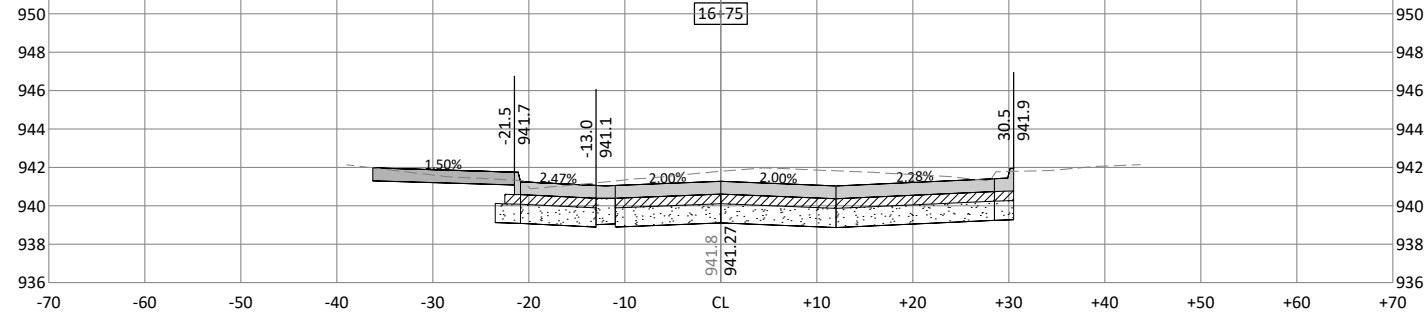
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CITY OF MARSHALLTOWN, IOWA

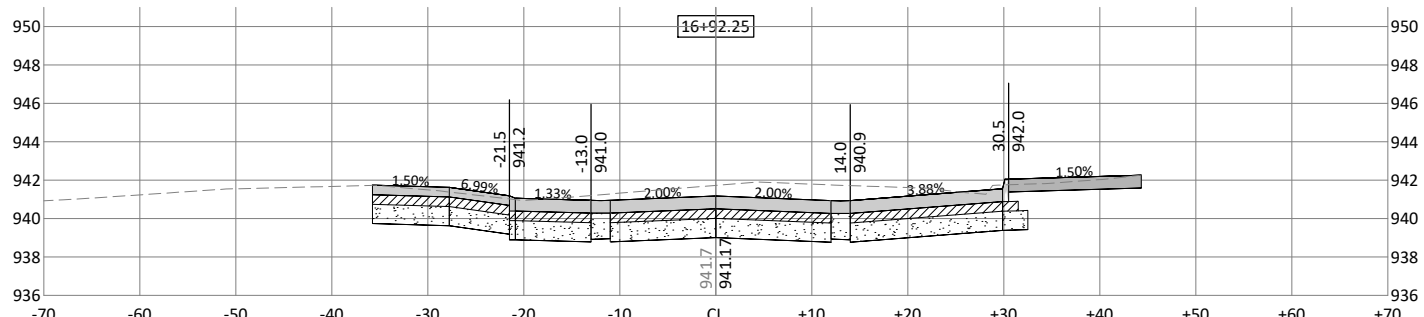
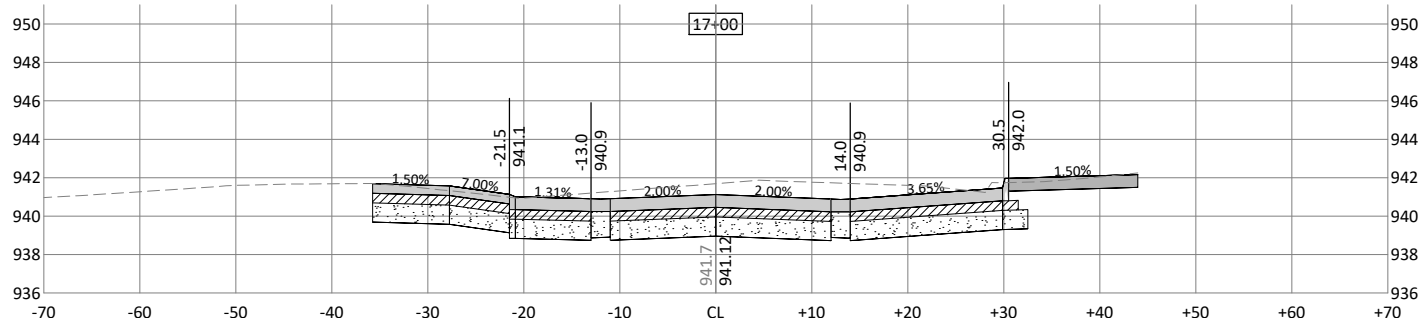
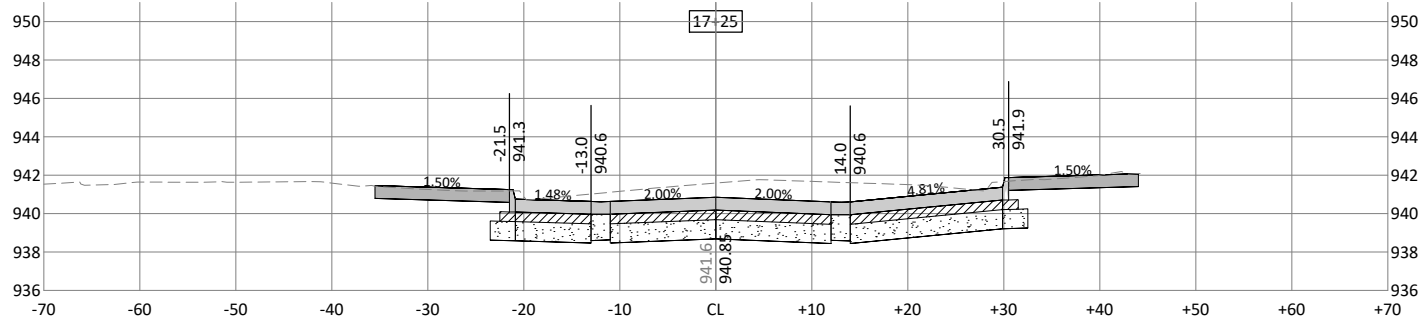
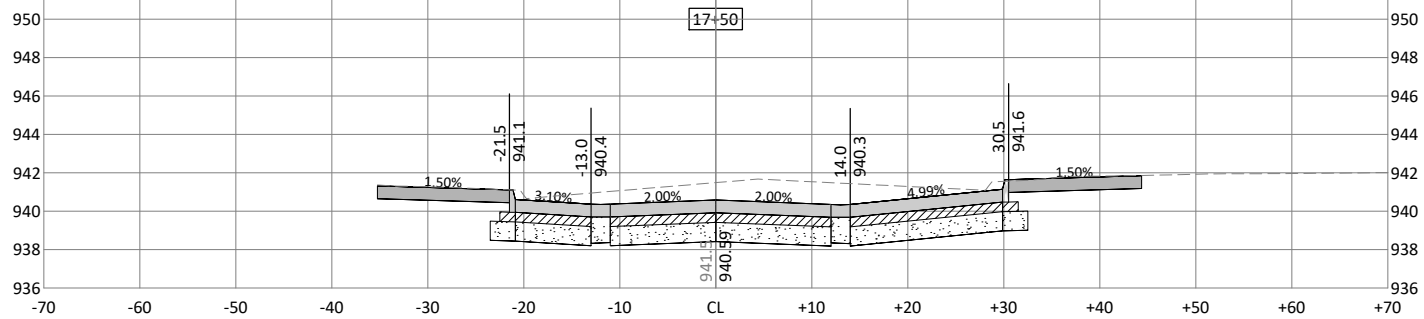
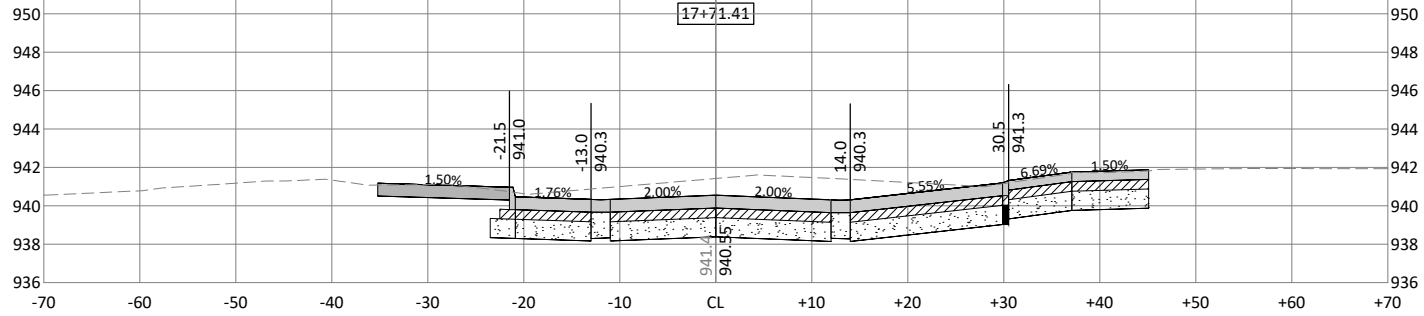
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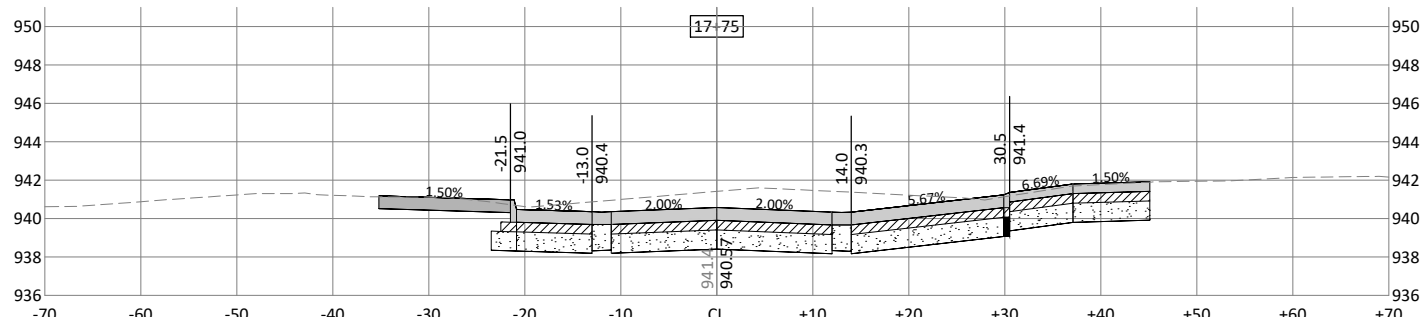
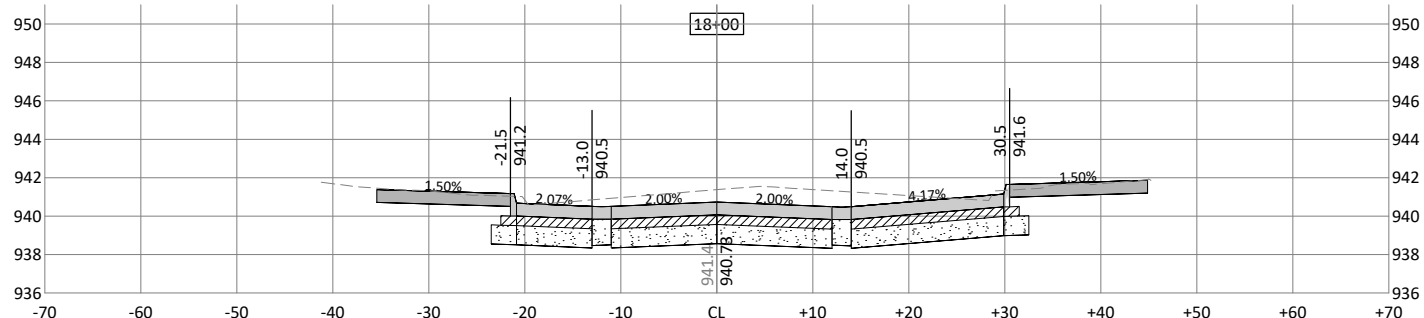
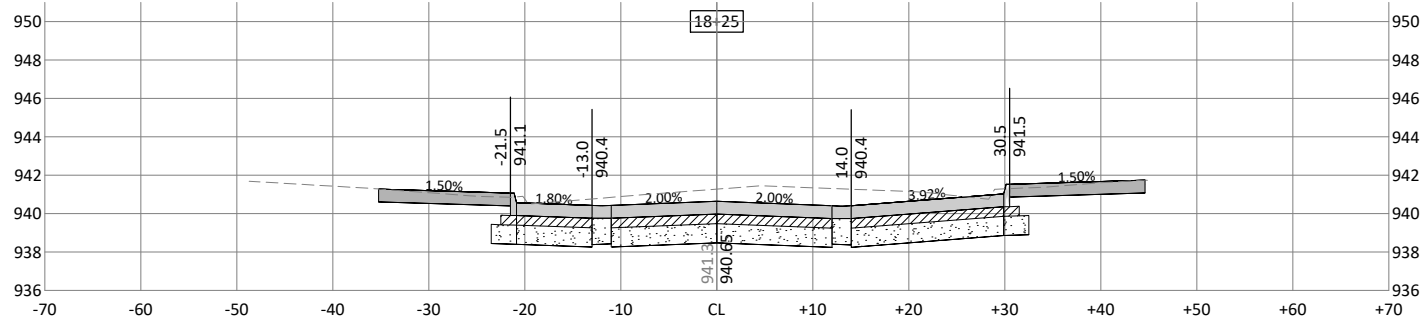
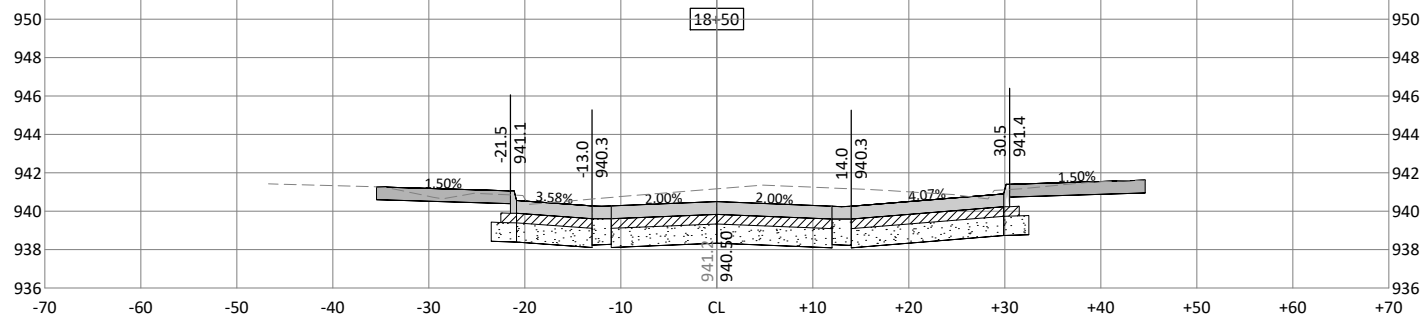
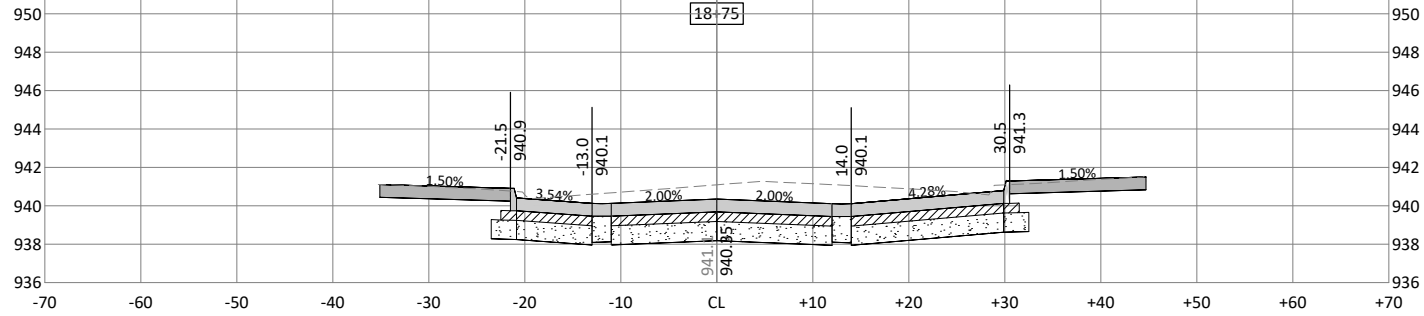
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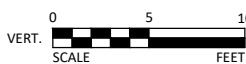
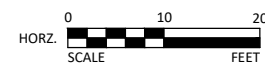
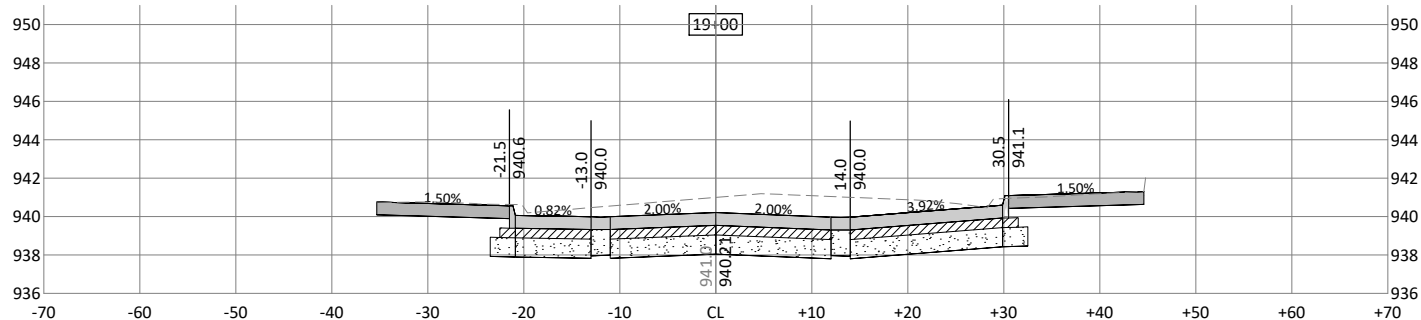
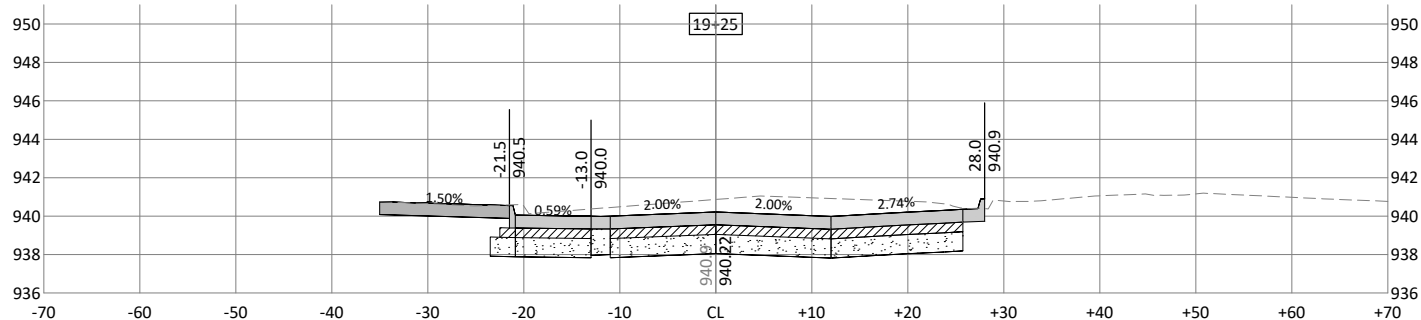
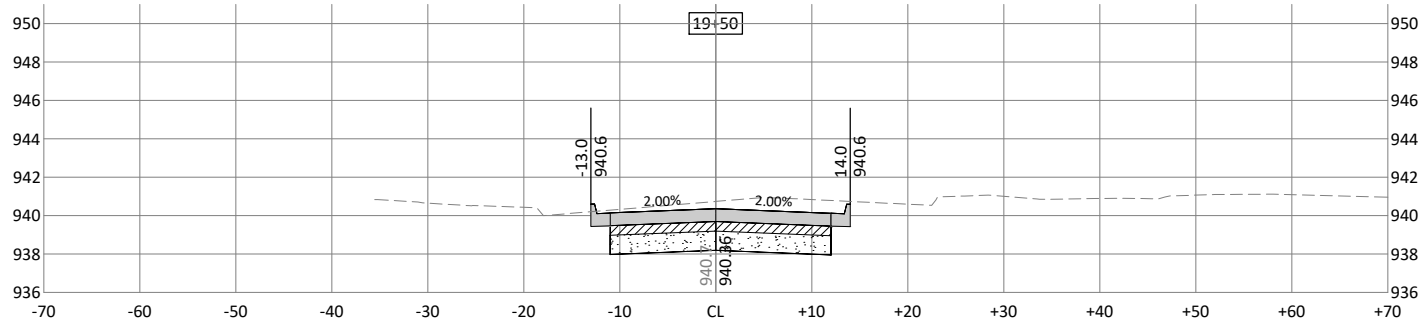
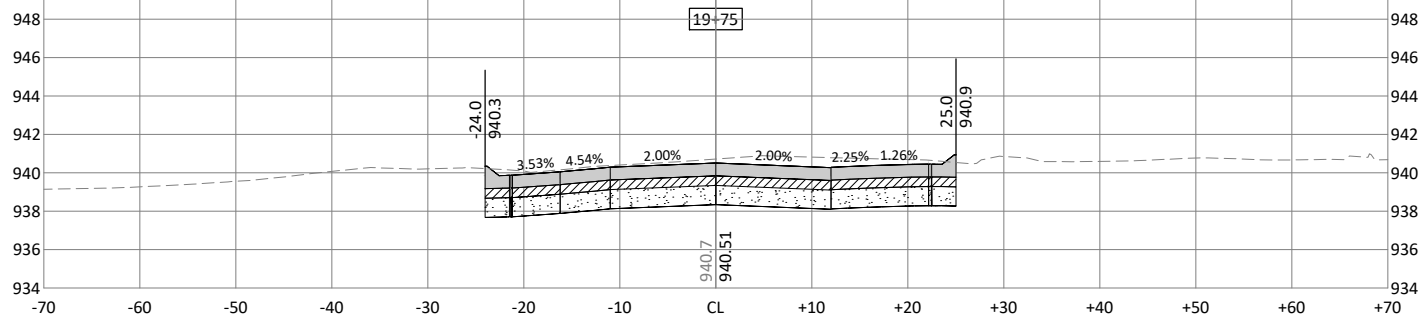
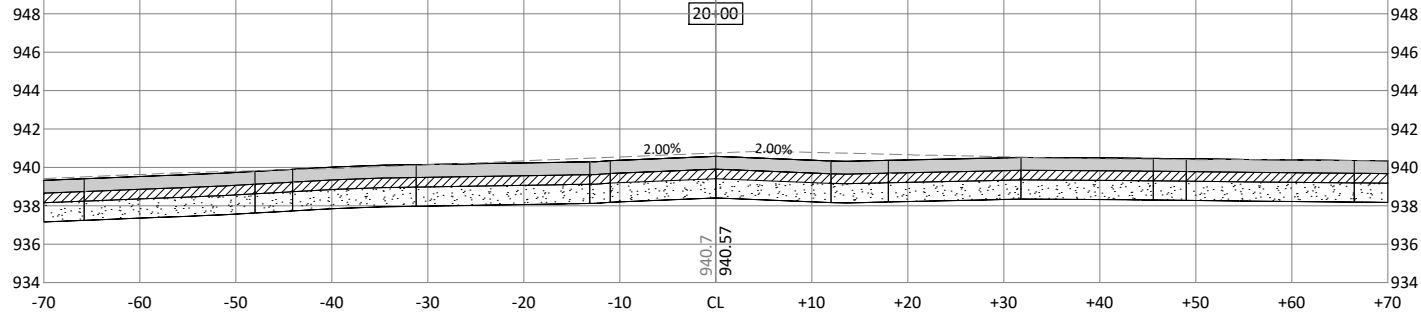


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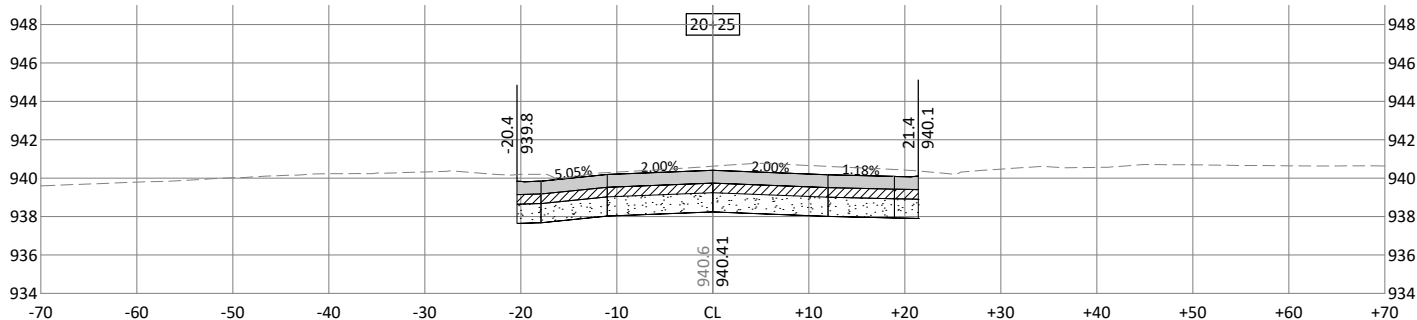
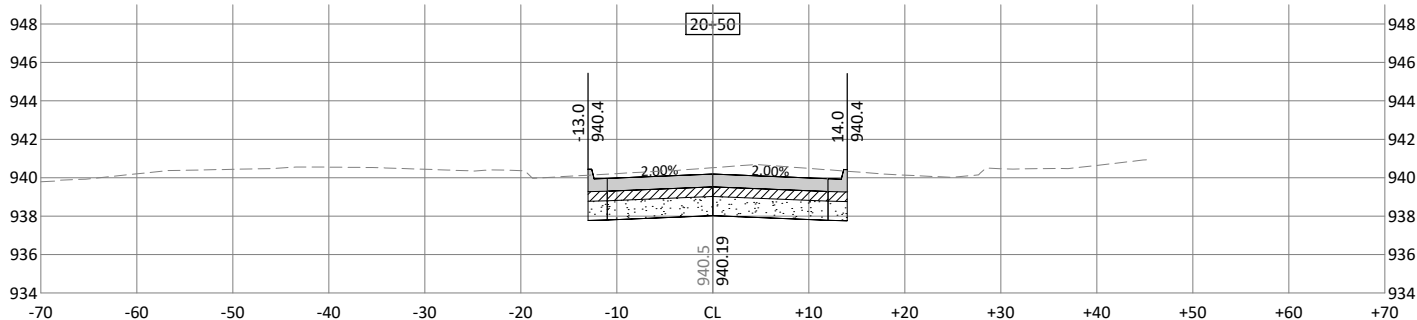
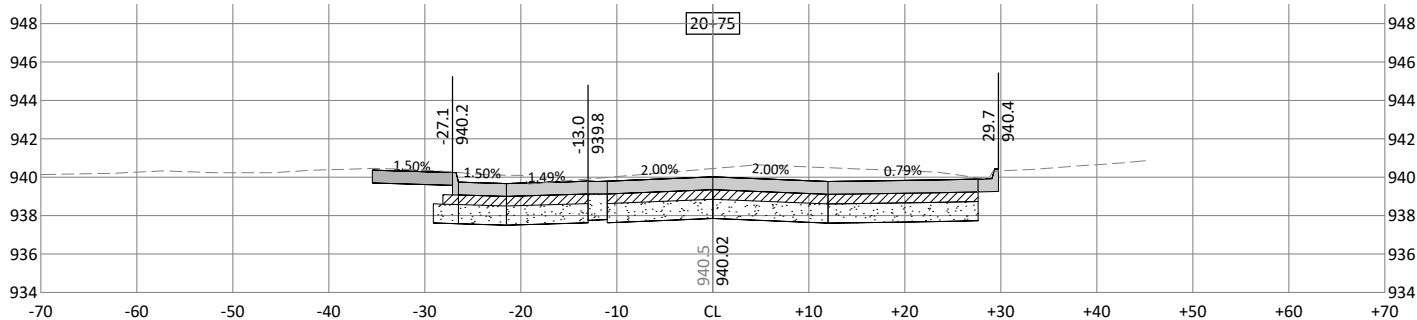
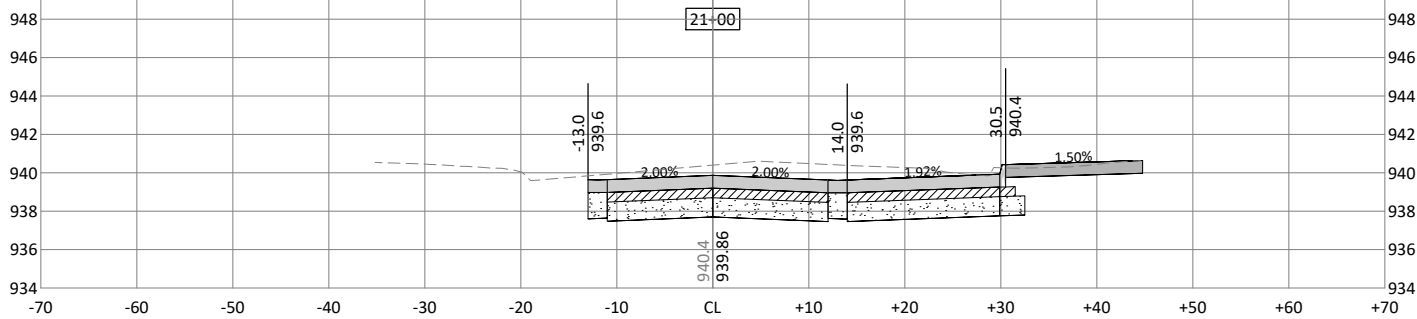
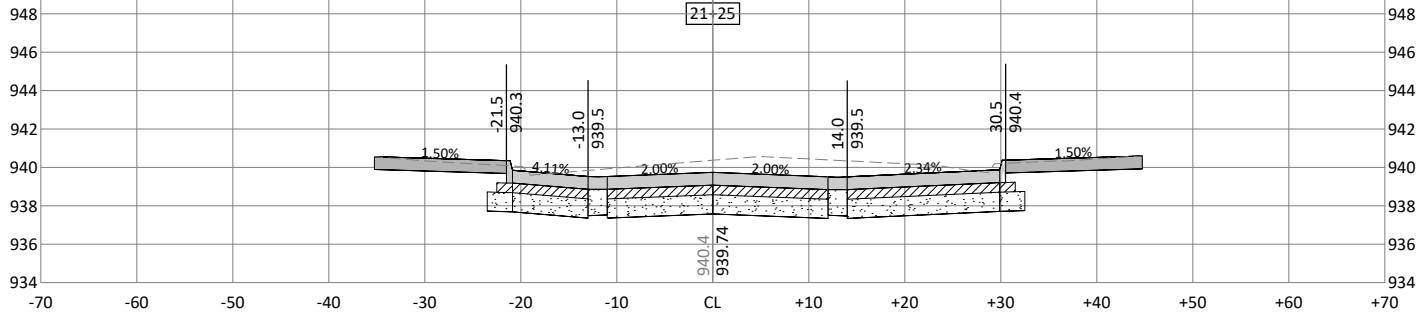
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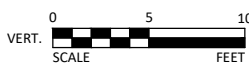
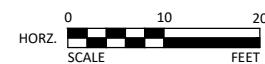
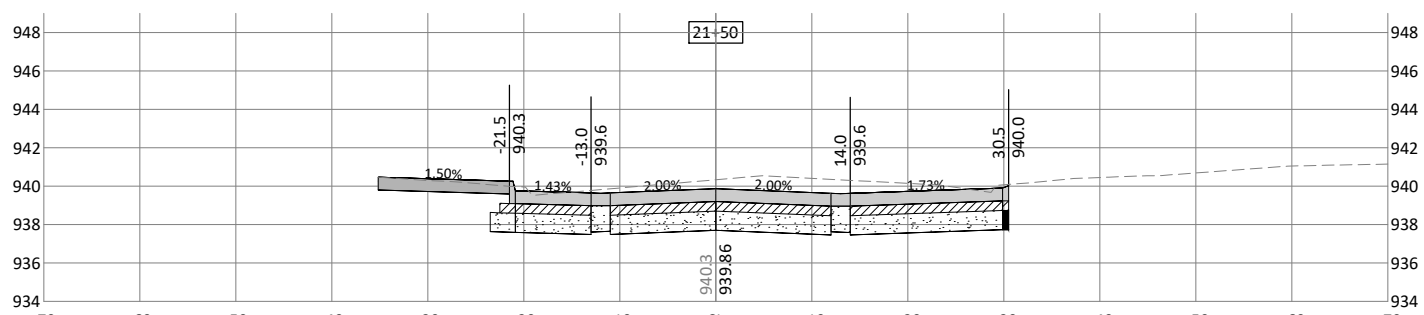
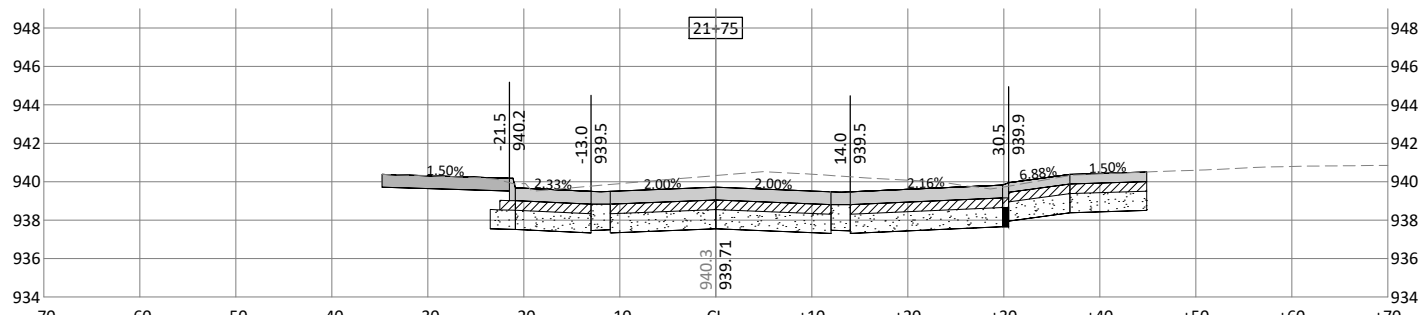
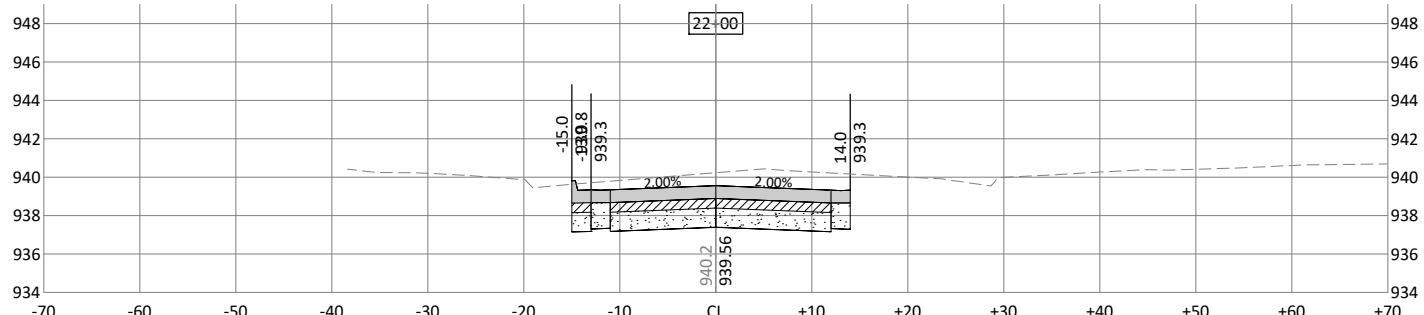
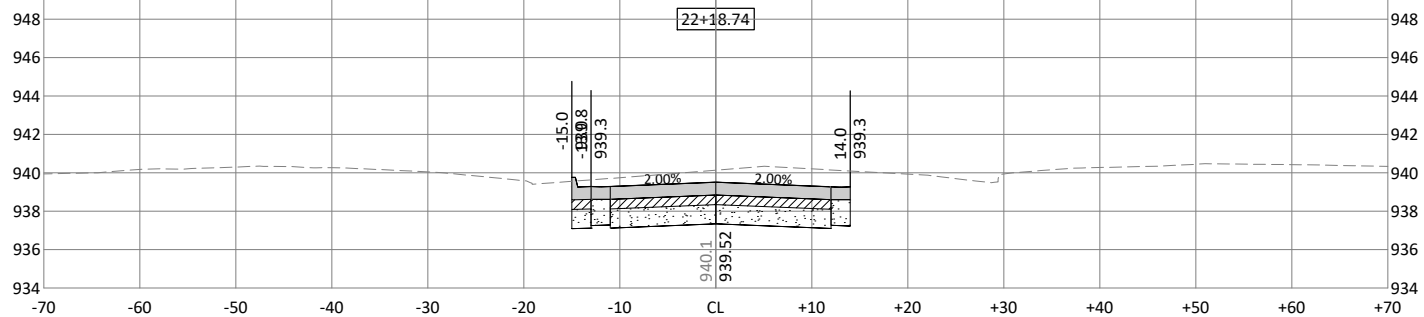
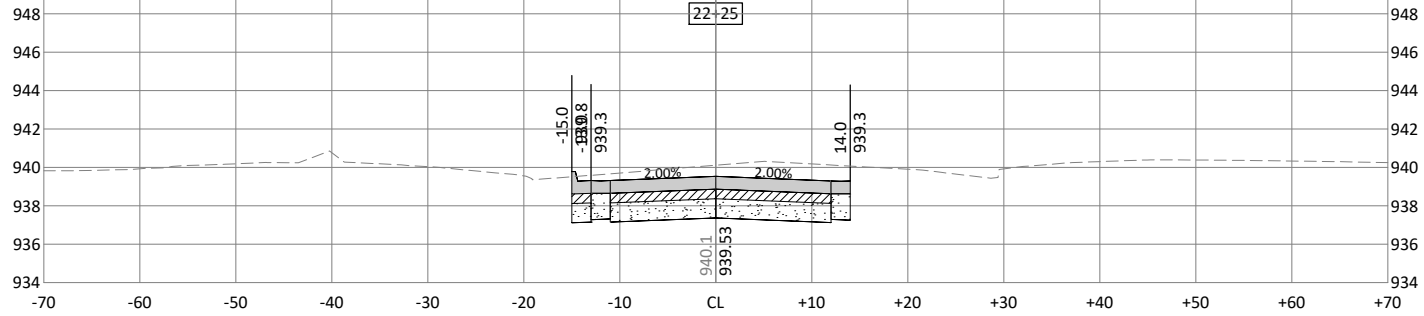
MAIN STREET RECONSTRUCTION

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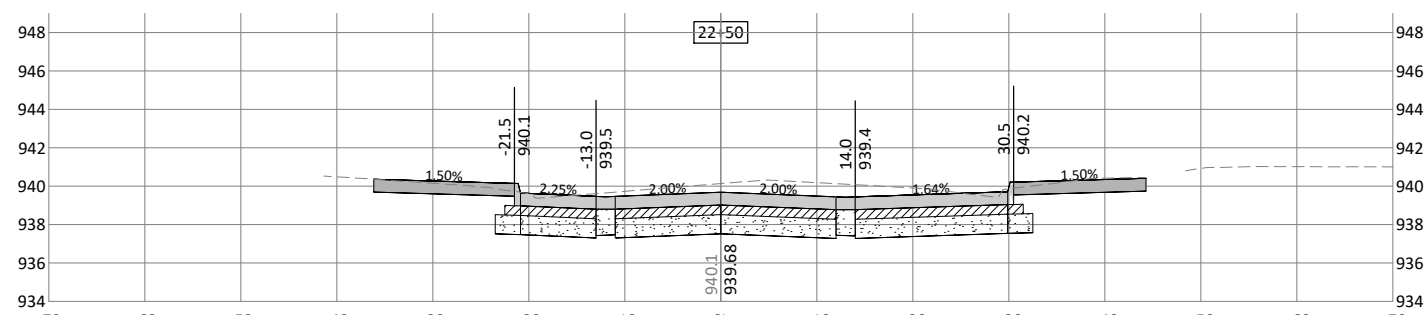
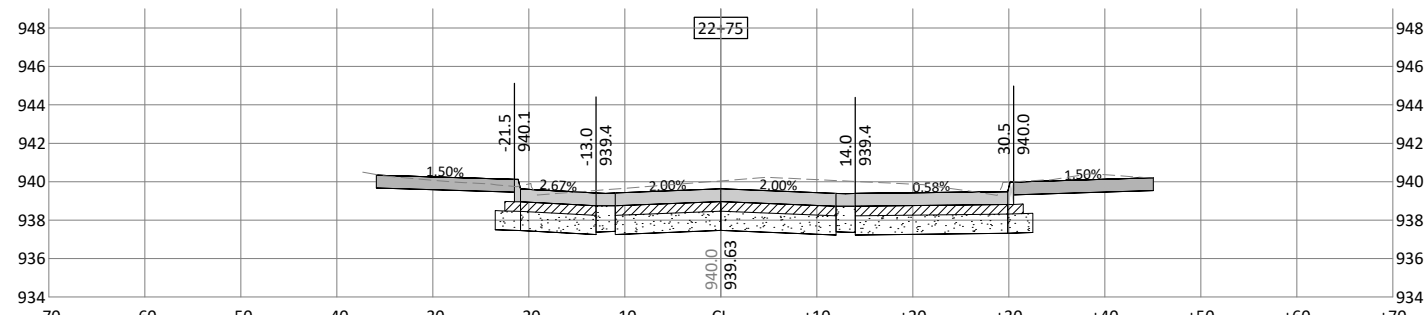
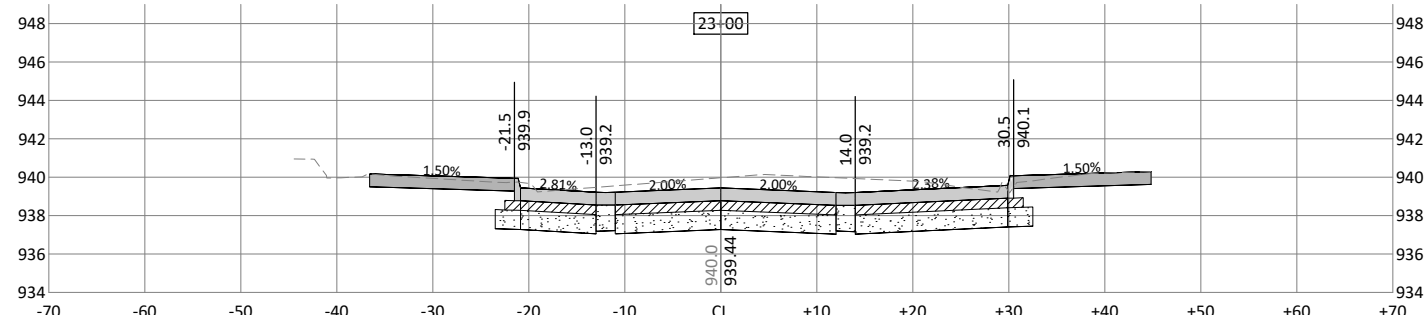
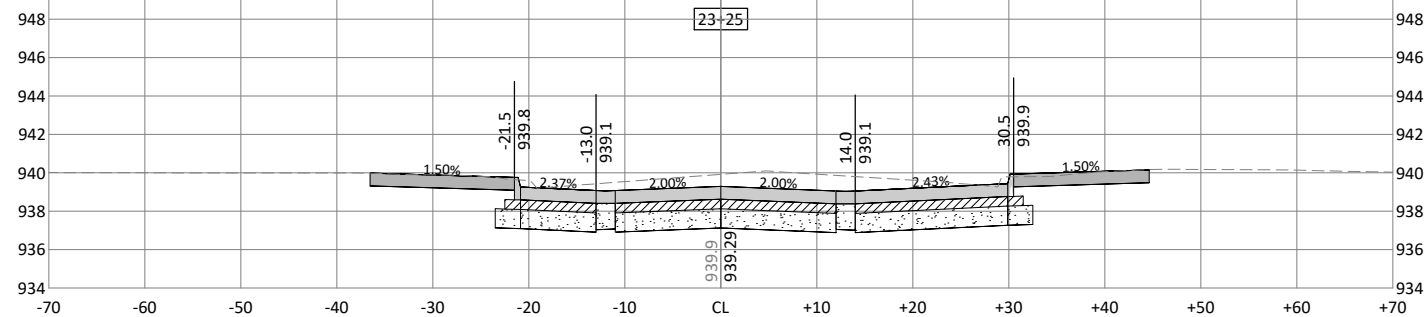
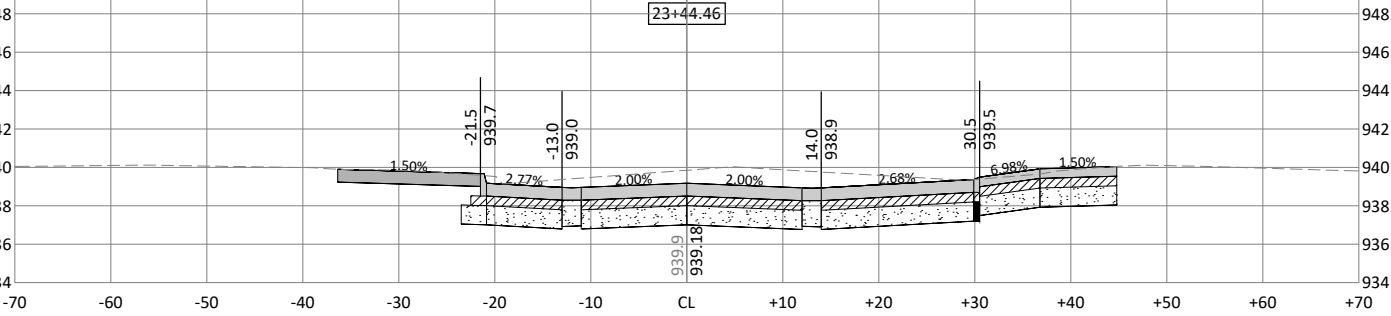
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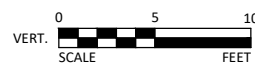
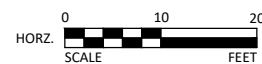
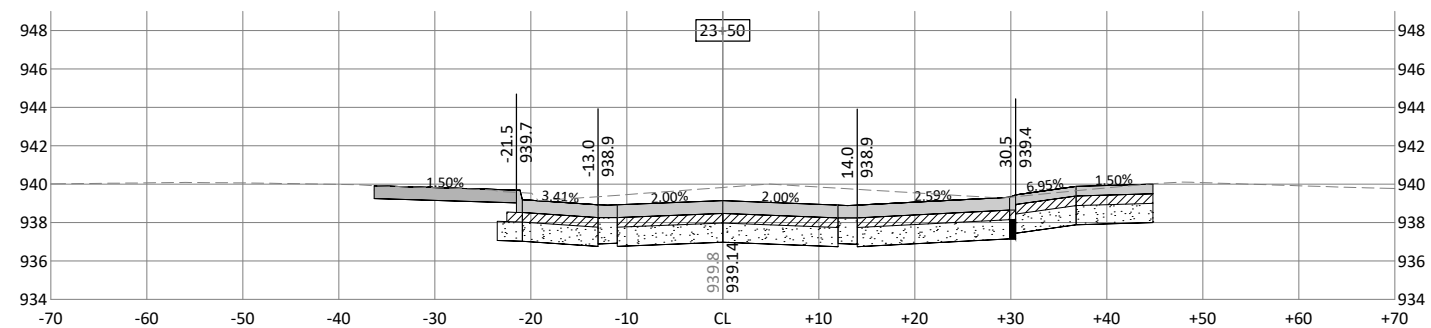
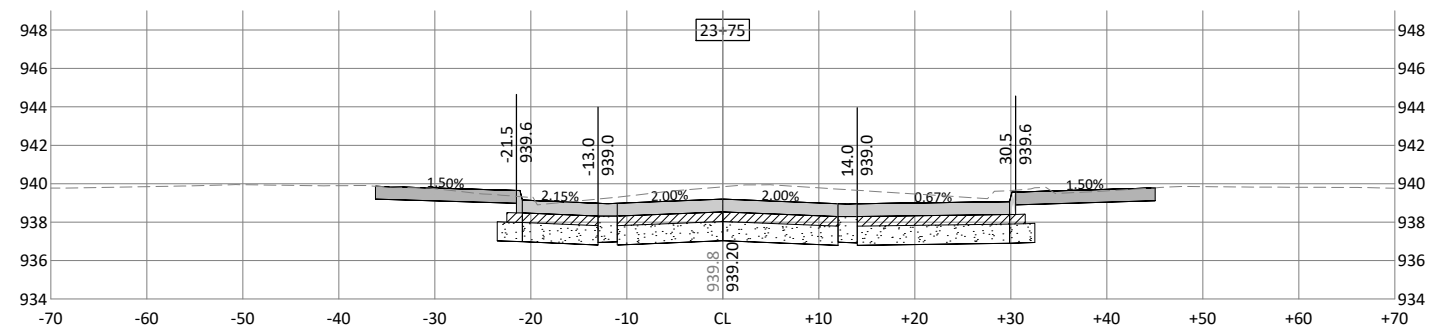
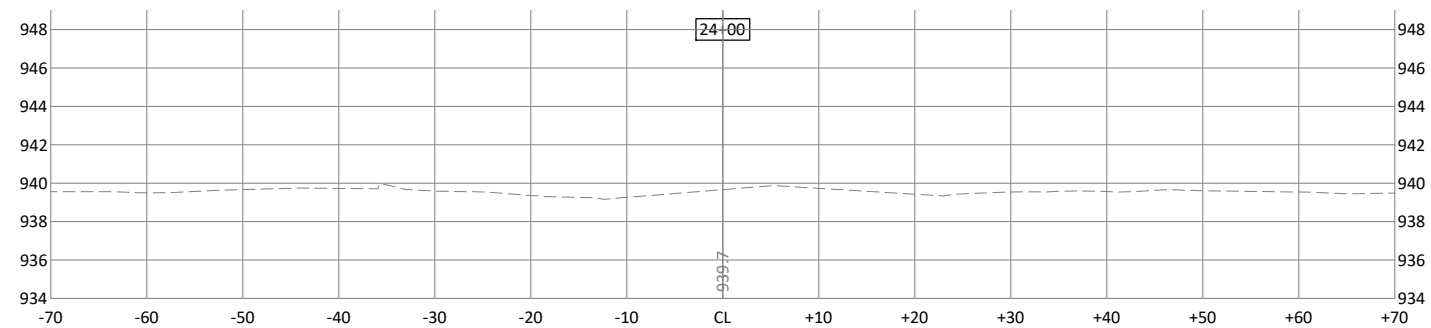
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CITY OF MARSHALLTOWN, IOWA

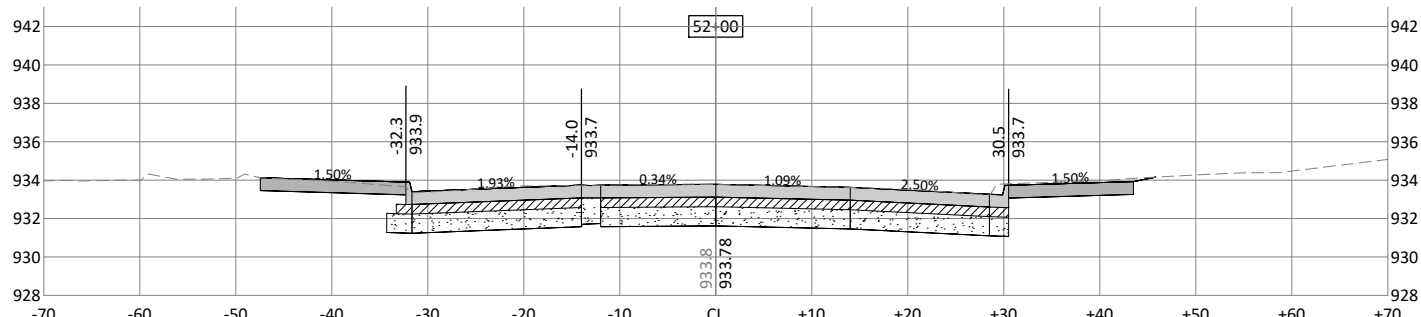
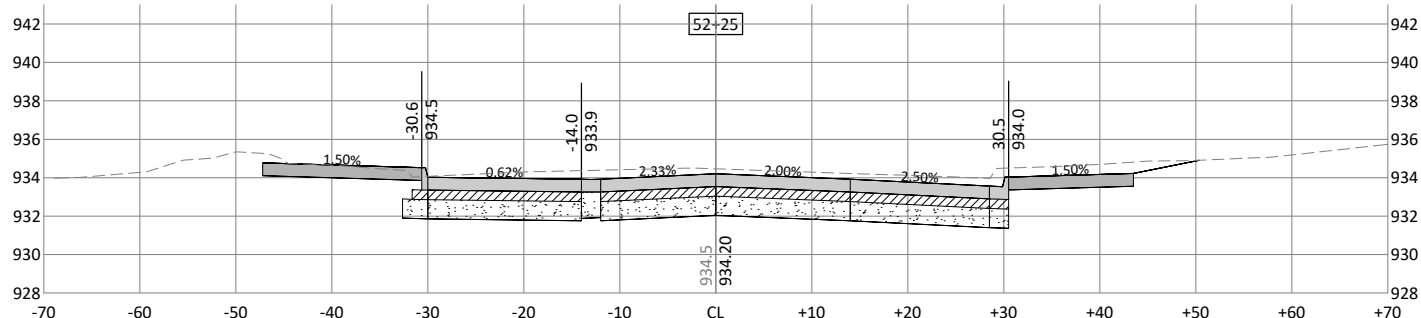
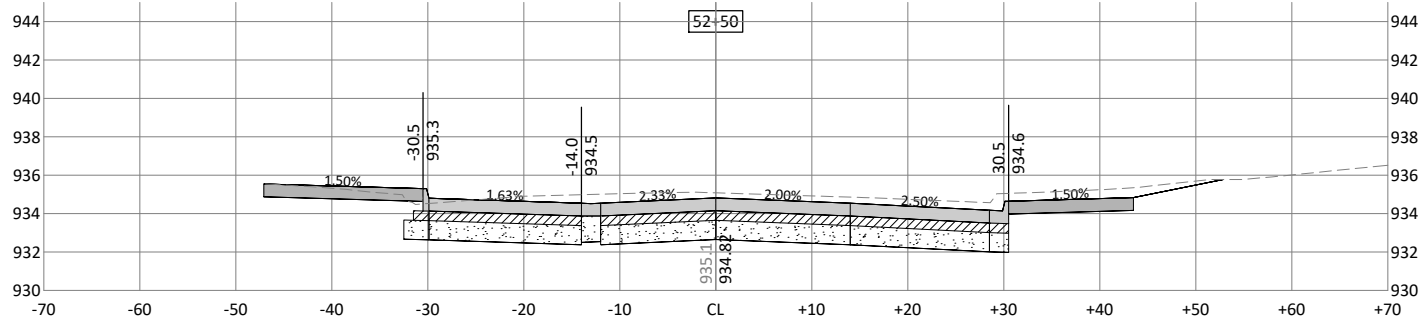
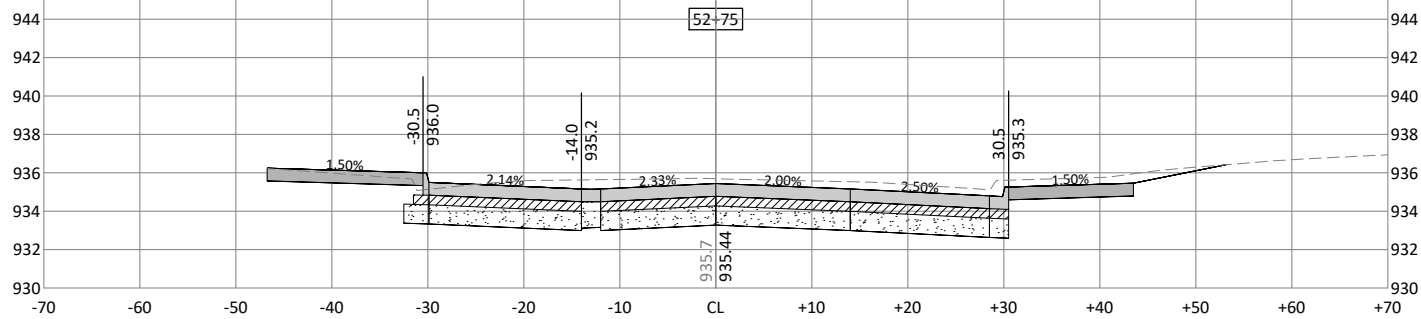
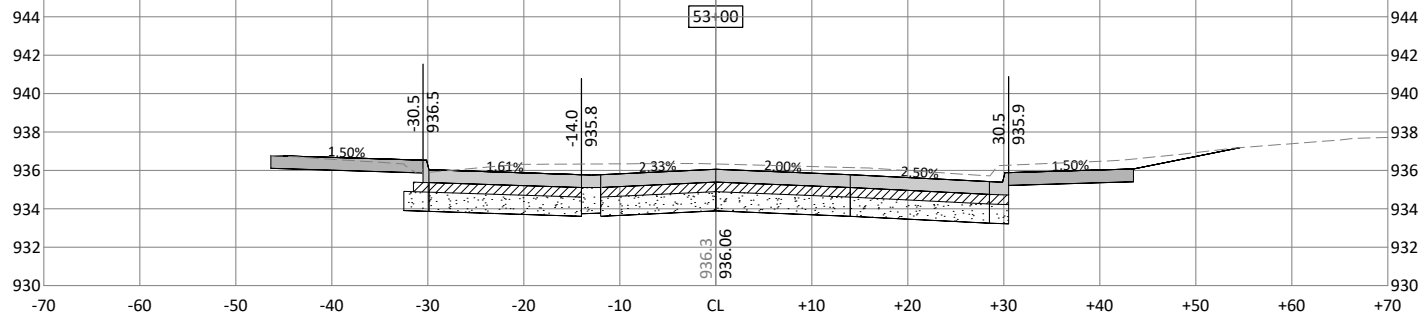
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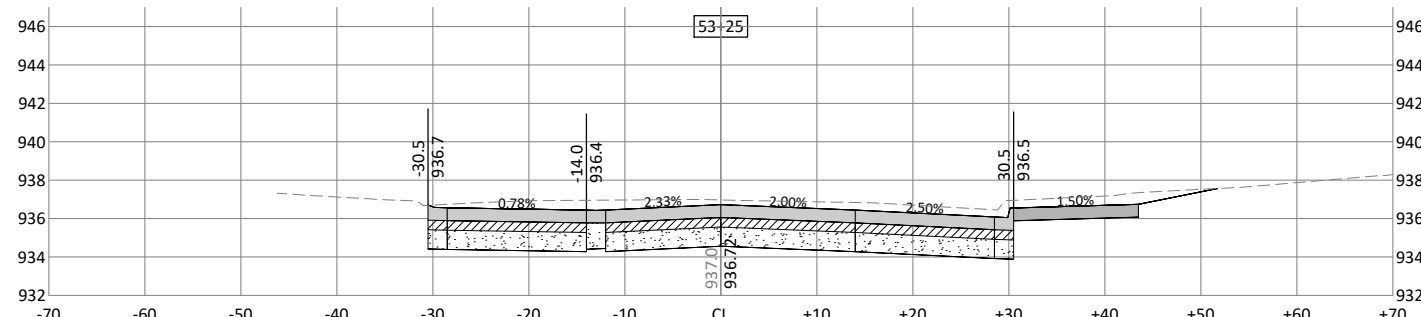
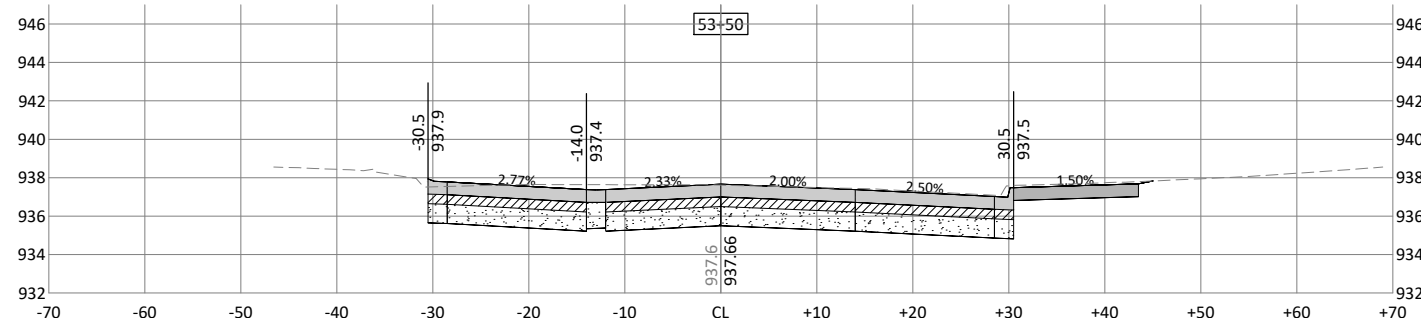
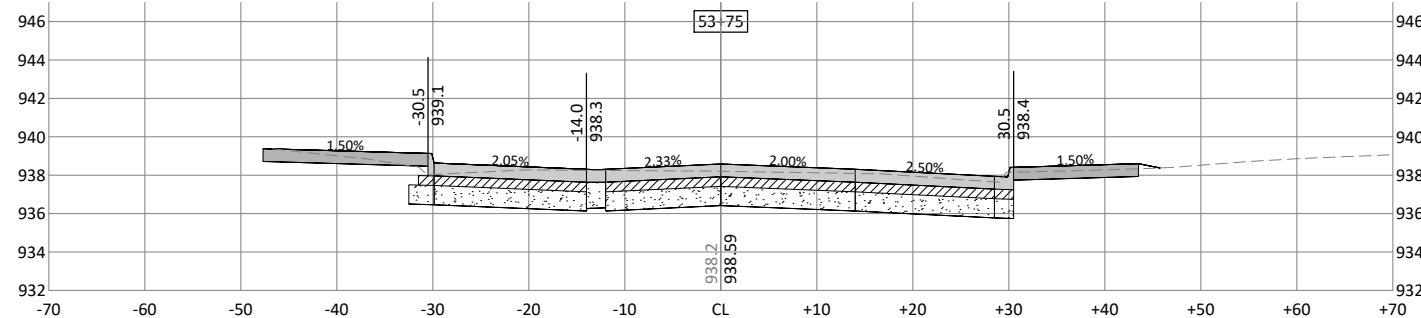
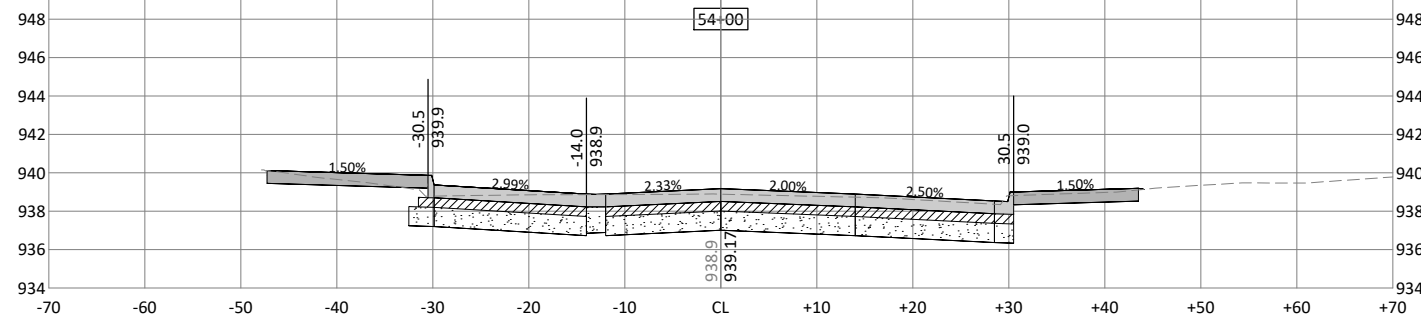
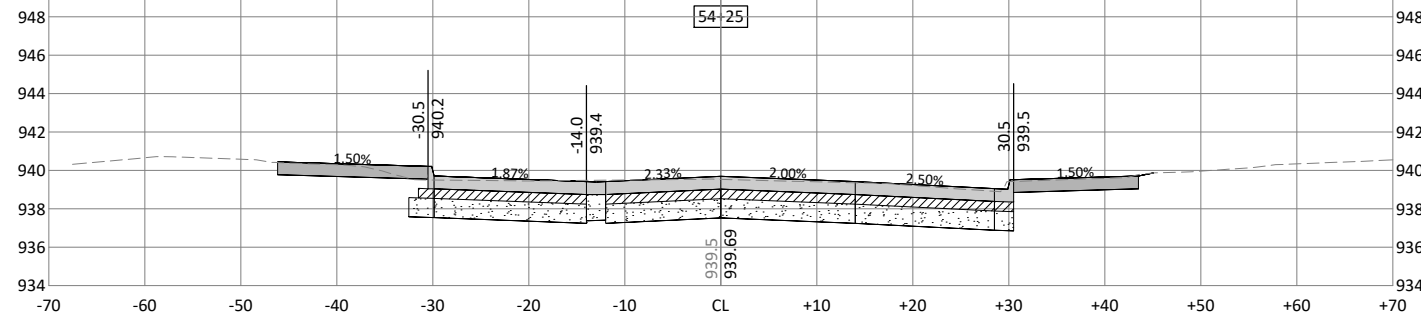
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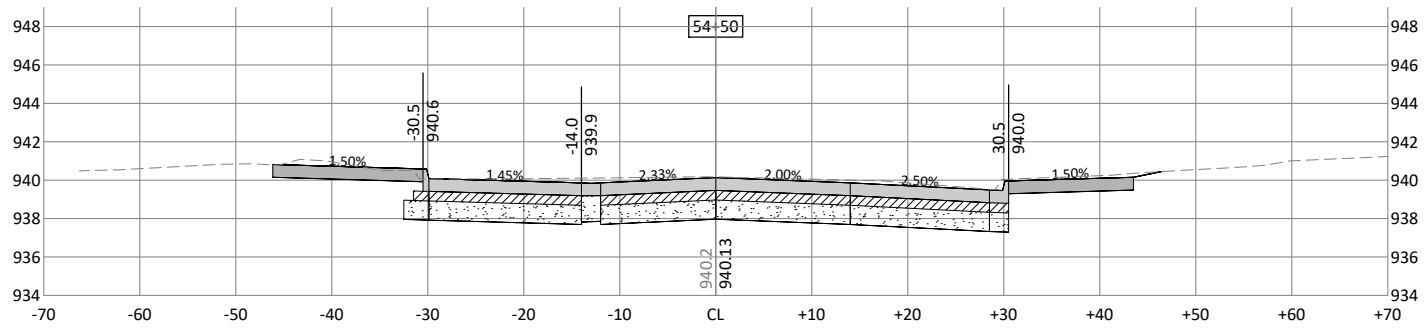
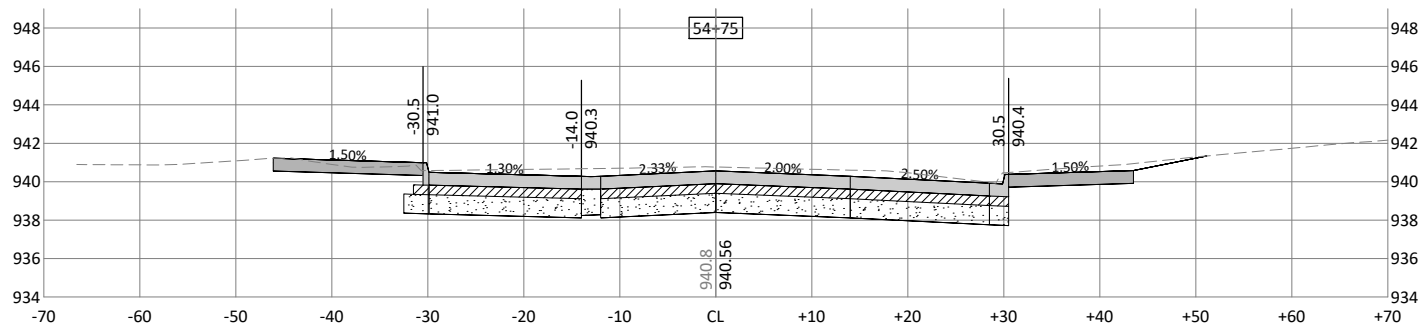
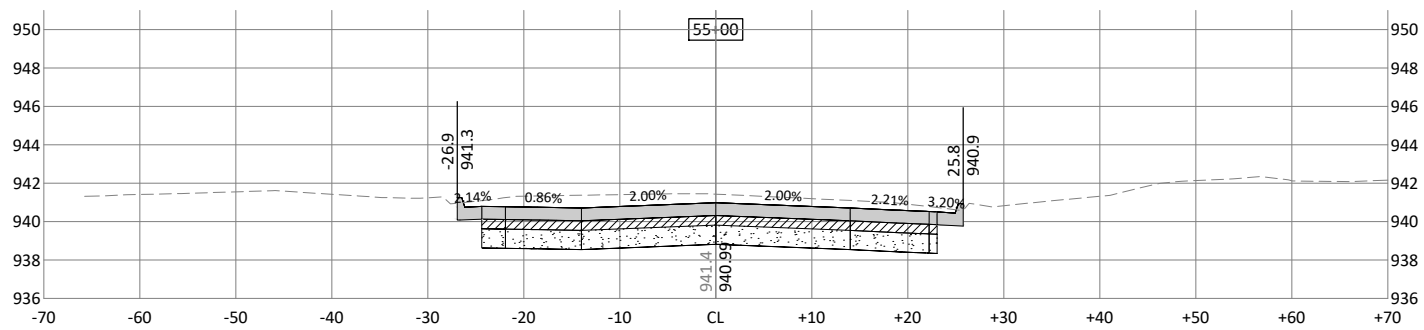


DESIGNED	DEM	REV	DESCRIPTION	DATE
DRAWN	DEM	A	90% PROGRESS PLANS	12/20/2024
CHECKED	GAB			
CLIENT PROJ. NO.	0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
CENTER STREET CROSS SECTIONS

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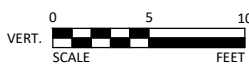
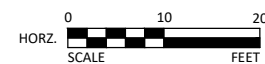
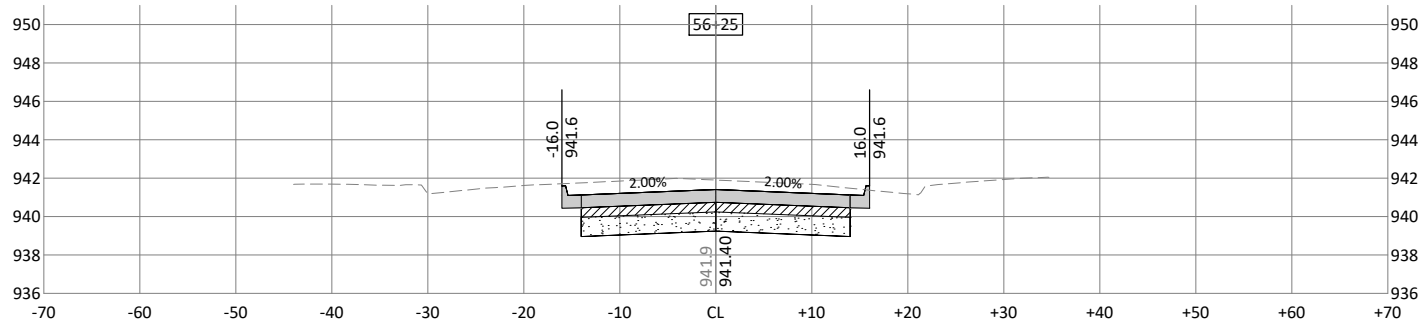
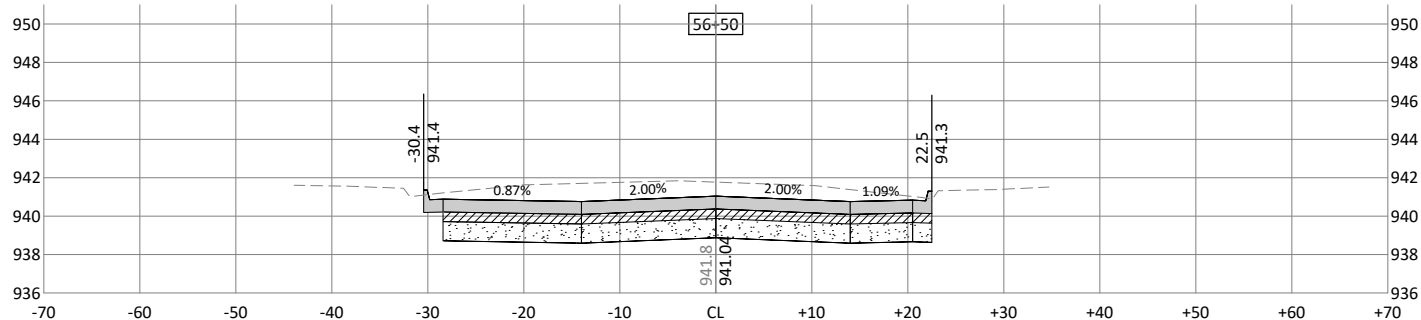
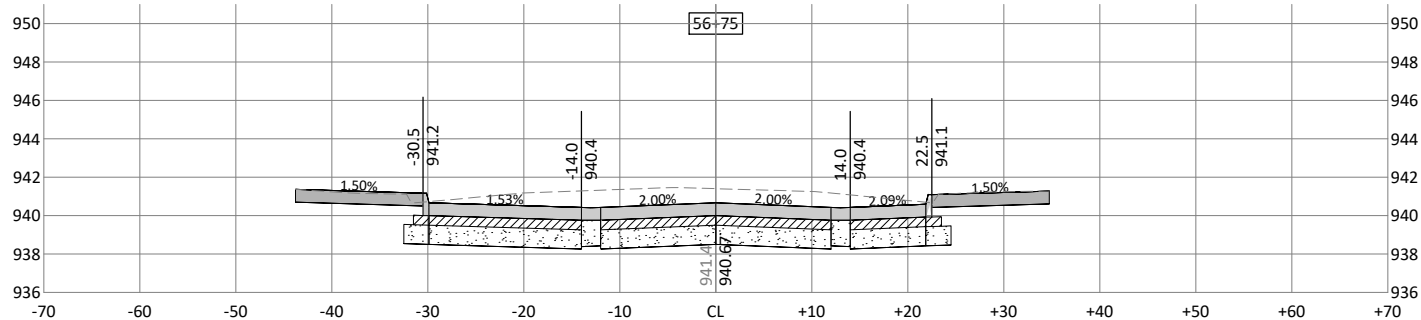
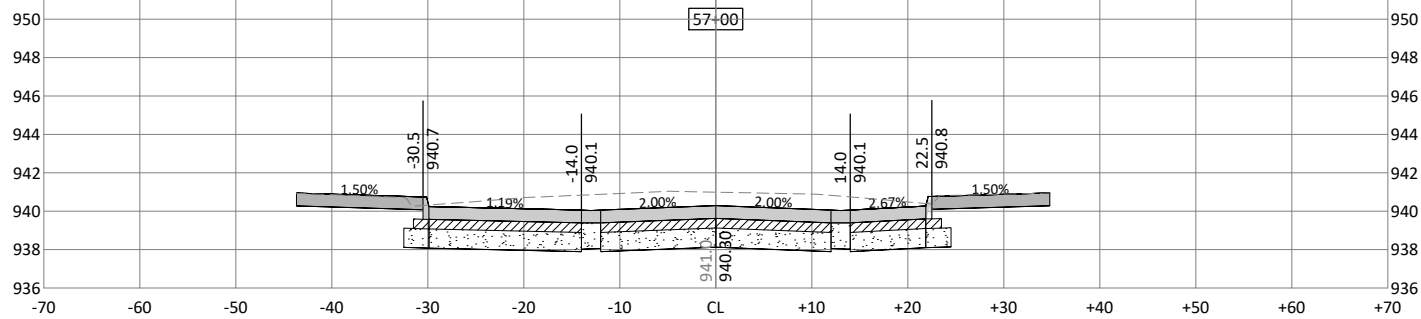
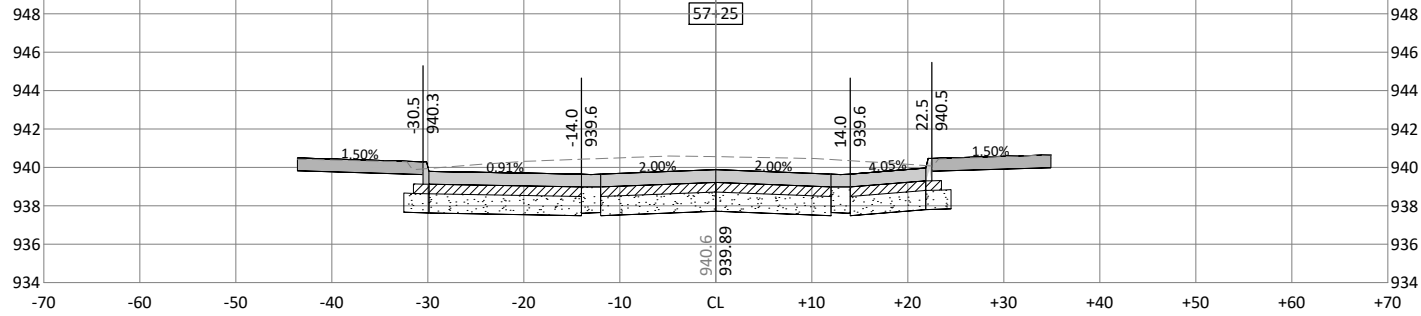
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DESIGNED	DEM	REV	DESCRIPTION	DATE
DRAWN	DEM	A	90% PROGRESS PLANS	12/20/2024
CHECKED	GAB			
CLIENT PROJ. NO.	0A1.129221			

CITY OF MARSHALLTOWN, IOWA
MAIN STREET RECONSTRUCTION
CENTER STREET CROSS SECTIONS

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DESIGNED	REV	DESCRIPTION	DATE
DEM	A	90% PROGRESS PLANS	12/20/2024
DRAWN			
CHECKED			
GAB			
CLIENT PROJ. NO.			
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CITY OF MARSHALLTOWN, IOWA

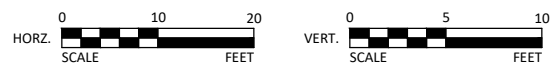
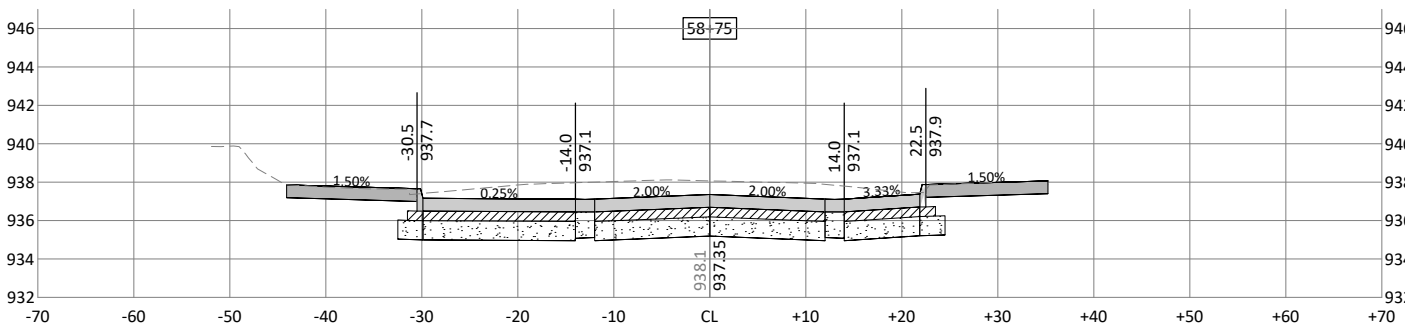
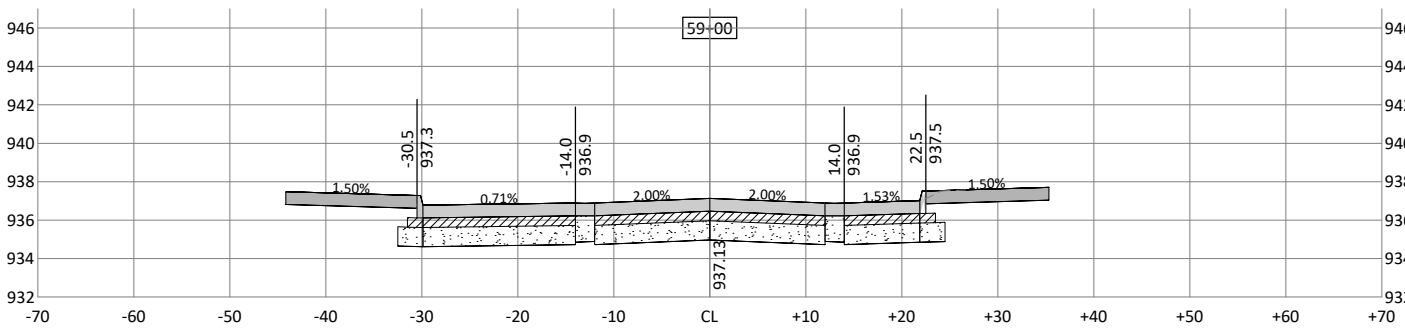
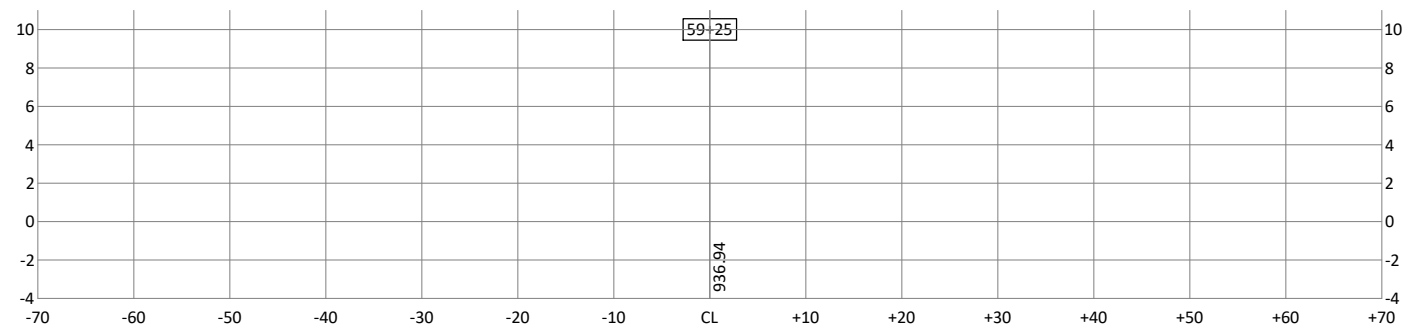
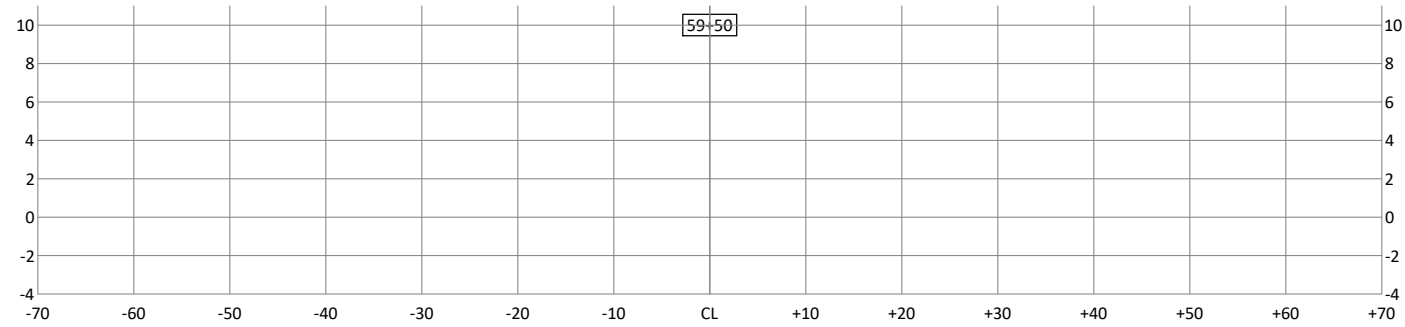
MAIN STREET RECONSTRUCTION

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DESIGNED	DEM	REV	DESCRIPTION	DATE
DRAWN	DEM	A	90% PROGRESS PLANS	12/20/2024
CHECKED	GAB			
CLIENT PROJ. NO.	0A1.129221			

CITY OF MARSHALLTOWN, IOWA	SHEET
MAIN STREET RECONSTRUCTION	
CENTER STREET CROSS SECTIONS	X.04



PROJECT MANUAL

Main Street Reconstruction

City of Marshalltown

Marshalltown, Iowa

February, 2025

Marshalltown Project Number: STR-22-002

BMI Project Number. 0A1.129221

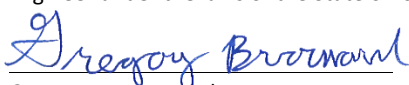
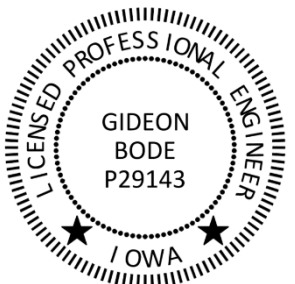


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SECTION 00005 - CERTIFICATION PAGE

PROJECT MANUAL
FOR
MAIN STREET RECONSTRUCTION
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA
FEBRUARY, 2025
BMI PROJECT NO. 0A1.129221

	I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly licensed Professional Landscape Architect under the laws of the State of Iowa.  Date: <u>2/5/2025</u> Casey J. Byers License No. 00637 My renewal date is June 30, 2025 Pages or sheets covered by this seal: <u>B.07-B.11, I.01-I.11, K.00-K.18</u>
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.  Date: <u>2/5/2025</u> Gregory A. Broussard License No. P21974 My renewal date is December 31, 2025 Pages or sheets covered by this seal: <u>A.01-B.06, C.01-H.05, J.01-J.12, L1.01-S.09, W.01-X.04</u>
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.  Date: <u>2/5/2025</u> Gideon Bode License No. P29143 My renewal date is December 31, 2025 Pages or sheets covered by this seal: <u>B.12-B.14</u>

SECTION 00010 - TABLE OF CONTENTS

Main Street Reconstruction
City of Marshalltown

CONTRACT DOCUMENTS:

PROJECT MANUAL:

Introductory Information, Bidding Requirements, Contract Forms and Conditions of Contract

00005 - CERTIFICATION PAGE
00010 - TABLE OF CONTENTS
00100 - NOTICE TO BIDDERS
00110 - NOTICE OF PUBLIC HEARING
00200 - INSTRUCTIONS TO BIDDERS
00410 - PROPOSAL
00420 - BID BOND
00450 - INFORMATION REQUESTED FROM THE LOW BIDDER
00500 - CONTRACT
00610 - PERFORMANCE, PAYMENT AND MAINTENANCE BOND
00800 - SPECIAL PROVISIONS
00900 - NOTICE OF AWARD
00910 - NOTICE TO PROCEED
00920 - LETTER OF TRANSMITTAL

Technical Specifications

03 11 00 – Concrete Formwork (Refers to Gateway Sign and Vault Work Only)
03 20 00 – Concrete Reinforcement (Refers to Gateway Sign and Vault Work Only)
03 30 00 – Cast-in-Place Concrete (Refers to Gateway Sign and Vault Work Only)
04 20 00 – Unit Masonry (Refers to Vault Work Only)
04 72 00 – Cast Stone
05 00 00 – Structural Metal (Refers to Gateway Sign Only)
32 81 00 – Irrigation System
32 91 13 – Structural Soil
33 14 00 – Insertion Valves
Special Provision - Section 7030 - Concrete Unit Paving
Special Provision - Section 9030 Plant Material and Planting

Alternates 1 and 2 Special Provisions

Supplemental Specifications

Marshalltown Water Work Specifications

DRAWINGS (UNDER SEPARATE COVER):

BASE BID: 185 sheets numbered A.01 through X.04, inclusive, dated February 5th, 2025, and with each sheet bearing the following general title:

Main Street Reconstruction
City of Marshalltown

ALTERNATES 1 AND 2: 12 sheets numbered C.100 through C.501, dated February 5th, 2025.

APPENDICES

Geotechnical Report

**This project is based on
SUDAS STANDARD SPECIFICATIONS, 2024 EDITION
unless modified herein.**

******END OF SECTION******

SECTION 00100 - NOTICE TO BIDDERS

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

Receipt and Opening of Sealed Proposals. Sealed proposals for the work comprising the repair or improvement as stated below must be filed before 10:00 A.M. on March 4, 2025, in the office of the Clerk, 24 N. Center Street, Marshalltown, Iowa 50158. Sealed proposals will be opened and publicly read with bids being tabulated at that time. The results will be reported to the City of Marshalltown at its meeting at 5:30 P.M. on March 10, 2025, at which time the Council may take action on the proposals submitted or at such time as may then be fixed. The City of Marshalltown Council reserves the right to reject any or all bids, to waive informalities or technicalities in any bid, and to enter into such contract, or contracts, as it shall deem to be in the best interest of the City of Marshalltown.

Time for Commencement and Completion of Work. Work on the improvement shall commence upon approval of the contract by the Council and as stated in the Notice to Proceed. All work under the contract must be complete on or before December 11, 2026. Liquidated damages are as set forth in Section 00500 – Contract. Interim completion dates shall apply as well based on Section 00500 - Contract

Bid Security. Each Bidder shall accompany its bid with bid security, as defined in Iowa Code Section 26.8, as security that the successful Bidder will enter into a contract for the work bid upon. The Bidder's security shall be in an amount equal to 5 percent of the total amount of the bid. The bid shall contain no condition except as provided in the specifications. If the Bidder fails to execute the contract and to furnish an acceptable Performance, Payment, and Maintenance Bond or provide a Certificate of Insurance within ten (10) days after acceptance of the bid by the City, the bid security may be forfeited or cashed by the City as liquidated damages.

Contract Documents. Copies of the project documents are available for a price of \$25.00 per set. This fee is refundable, provided the plans and specifications are returned complete and in reusable condition, and they are returned within fourteen (14) calendar days after the award of the project. Please make your check payable to Bolton & Menk, Inc. and send it to 1519 Baltimore Drive, Ames, Iowa 50010. Complete digital project bidding documents are available at www.bolton-menk.com or www.questcdn.com. You may view the digital plan documents for free by entering QuestCDN Project # Quest No. is 9512323 on the website's Project Search page. Documents may be downloaded for \$0.00. Please contact QuestCDN.com at 952-233-1632 or info@questcdn.com for assistance in free membership registration, viewing, downloading, and working with this digital project information.

Preference of Products and Labor. By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa, to the extent lawfully required under Iowa statutes.

Sales Tax Exemption Certificates. The Bidder shall not include sales tax in the bid. The City of Marshalltown will distribute tax exemption certificates and authorization letters to the contractor and all subcontractors who are identified. The contractor and subcontractor may make copies of the tax exemption certificates and provide a copy to each supplier providing construction materials. These tax exemption certificates and authorization letters are applicable only for this specific project under the contract.

PROJECT DESCRIPTION: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center Street from State Street to Church Street.

The Notice is given by order of the Council of the City of Marshalltown.

Alicia Hunter
Clerk

SECTION 00110 - NOTICE OF PUBLIC HEARING

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

Public Hearing on Proposed Contract Documents and Estimated Costs for Repair or Improvement. A public hearing will be held by the City of Marshalltown on the proposed contract documents (plans, specifications and form of contract) and estimated cost for the improvement at its meeting at 5:30 P.M. on February 24, 2025, at 24 N. Center Street, Marshalltown, Iowa 50158.

PROJECT DESCRIPTION: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center Street from State Street to Church Street.

At said hearing, the Council will consider the plans, specifications, proposed form of contract, and estimated total cost for the project, the same now being on file in the office of the Clerk, 24 N. Center Street, Marshalltown, Iowa 50158, reference to which is made for a more detailed and complete description of the proposed improvements, and at said time and place the said Council will also receive and consider any objections to said plans, specifications, estimate of cost, and form of contract made by any interested party.

SECTION 00200 - INSTRUCTIONS TO BIDDERS

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

The work comprising the above referenced project shall be constructed in accordance with the SUDAS Standard Specifications, 2024 Edition, and as further modified by the supplemental specifications and special provisions included in the contract documents. The terms used in the contract version of the documents are defined in said standard specifications. Before submitting a bid, please review the requirements of Division One, General Provisions and Covenants. Please be certain that all documents have been completed properly, as failure to complete and sign all documents and to comply with the requirements listed below can cause a submitted bid not to be read.

BID SECURITY

The bid security must be in the minimum amount of 5% of the total bid amount including all add alternates (do not deduct the amount of deduct alternates).

Bid security other than said bid bond shall be in accordance with Chapter 26 of the Iowa Code.

Bid security shall be in the form of a cashier's check or certified check drawn on a state chartered or federally chartered bank; or a certified share draft drawn on a state chartered or federally chartered credit union; or a bidder's bond with corporate surety satisfactory to the City of Marshalltown, hereinafter called the "Jurisdiction".

All signatures on the bid bond must be original signatures in ink; electronic, copies, or facsimile (fax) of any signature on the bid bond is not acceptable.

1.05 The bid bond must be submitted on the enclosed Bid Bond form as no other bid bond forms are acceptable.

SUBMISSION OF THE PROPOSAL AND IDENTITY OF BIDDERS

The Proposal shall be sealed in an envelope, properly identified as the "Proposal", with the project title and the name and address of the Bidder. The bid security shall be sealed in a separate envelope identified as the "Bid Security" and attached to the outside of the bid proposal envelope. The Proposal and Bid Security shall be deposited with the Jurisdiction at or before the time and at the place provided in the Notice to Bidders. It is the sole responsibility of the Bidder to see that its proposal is delivered to the Jurisdiction prior to the time for opening bids along with the appropriate bid security. Any proposal received after the scheduled time for the receiving of proposals will be returned to the Bidder unopened and will not be considered.

The following documents shall be completed, signed, and returned in the proposal envelope. The bid cannot be read if any of these documents are omitted from the proposal envelope.

A. PROPOSAL – Complete each of the following parts:

- Part B – Acknowledgment of Addenda, if any have been issued;
- Part C – Bid Items, Quantities and Prices;
- Part F – Additional Requirements; and
- Part G – Identity of Bidder.

Sign the proposal. The signature on the proposal and all proposal attachments must be an original signature in ink signed by the same individual who is the company owner or an authorized officer of the company; copies or facsimile of any signature will not be accepted.

Documents must be submitted as printed. No alterations, additions, or deletions are permitted. If the Bidder notes a requirement in the contract documents which the Bidder believes will require a conditioned or unsolicited alternate bid, the Bidder must immediately notify the Engineer in writing. The Engineer will issue any necessary interpretation by an addendum.

Division 1 - General Provisions and Covenants of the 2025 SUDAS Standard Specifications is modified as follows:

B. Section 1020.1.09B, Unit Price Attachment.

A computer-generated unit price attachment may be submitted by the Bidder as specified by this section.

The City will award the bid to the lowest responsive responsible bidder as determined by the Council in its sole discretion and that the Council reserves the right to reject any or all bids and to waive any irregularities or formalities.

PROSECUTION AND PROGRESS OF THE WORK

The work is located in the City of Marshalltown.

Work on the improvement shall commence upon approval of the contract by the Council and as stated in the Notice to Proceed. All work under the contract must be completed as stated in Section 00500 - Contract. Liquidated damages will be assessed as detailed in Section 00500 - Contract.

Community Events.

Successful Bidder will be required to coordinate with the Jurisdiction and accommodate the Jurisdiction's requirements for the following list of events:

- October Fest
- Holiday Stroll
- Bee Ridiculous Day

Each successful Bidder will be required to furnish a corporate surety bond in an amount equal to 100% of its contract price. Said bond shall be issued by a responsible surety approved by City of Marshalltown and shall guarantee the faithful performance of the contract, the terms and conditions therein contained, the prompt payment of all material and labor, protect and save harmless the City of Marshalltown from claims and damages of any kind caused by the operations of the contract, and shall also guarantee the maintenance of the improvement caused by failures in materials and construction for a period of 4 years from and after acceptance of the work.

The City of Marshalltown, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42U.S.C. 2000d to 2000d-4 and Title 49 Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all Bidders that it will affirmatively ensure that with any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

PREFERENCE OF PRODUCTS AND LABOR

In accordance with Iowa statutes, a resident bidder shall be allowed preference against a nonresident bidder from a state or foreign country provided that state or foreign country gives or requires any preference to bidders from that state or foreign country. This includes, but is not limited to any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country. The preference allowed shall be equal to the preference given or required by the state or foreign country in which the nonresident bidder is a resident. In the instance of a resident labor force preference, a nonresident bidder shall apply the same resident labor force preference to a public improvement in this state as would be required in the construction of a public improvement by the state or foreign country in which the nonresident bidder is a resident. If it is determined that this may cause denial of federal funds which would otherwise be available or would otherwise be inconsistent with requirements of any federal law or regulation, this resident bidder preference shall be suspended, but only to the extent necessary to prevent denial of the funds or to eliminate the inconsistency with federal requirements.

TAXES

The City will issue a sales tax exemption certificate and authorization letters to the contractor and all subcontractors for all materials purchased on the project. Tax exemption certificates are applicable only for the specific project for which the tax exemption certificate is issued.

The contractor shall provide a listing to the City identifying all appropriate subcontractors qualified for use of the tax exemption certificate. The contractor and subcontractors may make copies of the certificate and provide to each supplier providing construction material.

Income Tax:

- C. Successful Bidder is subject to payment of Iowa income tax on income from this work in amounts prescribed by law.
- D. If successful Bidder is a non-Iowa partnership, individual, or association, Bidder shall furnish evidence prior to execution of contract that bond or securities have been posted with the Iowa Department of Revenue in the amount required by law.

ADDITIONAL ITEMS

Qualification of Bidders

- E. To demonstrate the Bidder's qualifications to perform the work, after submitting its bid and within 5 days of owners request, Bidder must submit the following information:
 - 1. Written evidence establishing the Bidder's qualifications such as financial data, previous experience, and present commitments.
 - 2. A written statement that the Bidder is authorized to do business in the State of Iowa, or a written certification that Bidder will obtain such authority prior to the effective date of the contract.
 - 3. The Bidder's state or other contractor license number, if applicable.
 - 4. Subcontractors and suppliers qualification information.
 - 5. Other required information regarding qualifications.
- F. A Bidder's failure to submit required qualification information within the times indicated may disqualify the Bidder from receiving award of the contract.
- G. No requirement in this Article to submit information will prejudice the right of the Jurisdiction to seek additional pertinent information regarding the Bidder's qualifications.

Pre-Bid Conference

- H. A pre-bid conference will not be conducted for this Project.

Site Visit and Testing by Bidders - Other Site Related Documents

- A. Bidder shall conduct the required site visit during normal working hours.

******END OF SECTION******

SECTION 00410 - PROPOSAL

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

PROPOSAL: PART A – SCOPE

The City of Marshalltown, hereinafter called the “Jurisdiction”, has need of a qualified contractor to complete the work comprising of the below referenced repair or improvement. The undersigned Bidder hereby proposes to complete the work comprising of the below referenced repair or improvement as specified in the contract documents, which are officially on file with the Jurisdiction, in the office of the Mayor, at the prices hereinafter provided in Part C of the Proposal, for the improvements on the Main Street Reconstruction.

PROPOSAL: PART B – ACKNOWLEDGMENT OF ADDENDA

The Bidder hereby acknowledges that all addenda become a part of the contract documents when issued and that each such addendum has been received and utilized in the preparation of this bid. The Bidder hereby acknowledges receipt of the following addenda by inserting the number of each addendum in the blanks below:

ADDENDUM NUMBER _____

ADDENDUM NUMBER _____

ADDENDUM NUMBER _____

ADDENDUM NUMBER _____

and certifies that said addenda were utilized in the preparation of this bid.

PROPOSAL: PART C – BID ITEMS AND QUANTITIES

UNIT PRICE CONTRACTS: The Bidder must provide the Unit Bid Price, the Total Bid Price, any Alternate Prices, and the Total Construction Costs on the Proposal Attachment: Part C – Bid Items and Quantities. In case of discrepancy, the Unit Bid Price governs. The quantities shown on the Proposal Attachment: Part C – Bid Items and Quantities are approximate only, but are considered sufficiently adequate for the purpose of comparing bids.

SEE INCLUDED PROPOSAL ATTACHMENT

PROPOSAL: PART D – GENERAL

The Bidder hereby acknowledges that the Jurisdiction, in advertising for public bids for this project reserves the right to:

1. Reject any or all bids. Award of the contract, if any, to be to the lowest responsible, responsive Bidder; and
2. Reject any or all alternates in determining the items to be included in the contract. Designation of the lowest responsible, responsive Bidder to be based on comparison of the total bid only, not including any alternates; and
3. The City will award the bid to the lowest responsive responsible bidder as determined by the Council in its sole discretion and that the Council reserves the right to reject any or all bids and to waive any irregularities or formalities
4. Make such alterations in the contract documents or in the proposal quantities as it determines necessary in accordance with the contract documents after execution of the contract. Such alterations shall not be considered a waiver of any conditions of the contract documents, and shall not invalidate any of the provisions thereof; and

The Bidder hereby agrees to:

1. Enter into a contract, if this proposal is selected, in the form approved by the Jurisdiction, provide proof of registration with the Iowa Division of Labor in accordance with Chapter 91C of the Iowa Code, and furnish a performance, maintenance, and payment bond; and
2. Forfeit bid security, not as a penalty but as liquidated damages, upon failure to enter into such contract and/or to furnish said bond; and
3. Commence the work upon written Notice to Proceed; and
4. Complete the work in accordance with the completion dates defined in Section 00500 – Contract; and
5. Pay liquidated damages for noncompliance with said completion provisions at the rate detailed in Section 00500 – Contract for each calendar day thereafter that the work remains incomplete.

PROPOSAL: PART E – NON-COLLUSION AFFIDAVIT

The Bidder hereby certifies:

1. That this proposal is not affected by, contingent on, or dependent on any other proposal submitted for any improvement with the Jurisdiction; and
2. That no individual employed by the Bidder has employed any person to solicit or procure the work on this project, nor will any employee of the Bidder make any payment or agreement for payment of any compensation in connection with the procurement of this project; and
3. That no part of the bid price received by the Bidder was or will be paid to any person, corporation, firm, association, or other organization for soliciting the bid, other than the payment of their normal compensation to persons regularly employed by the Bidder whose services in connection with the construction of the project were in the regular course of their duties for the Bidder; and
4. That this proposal is genuine and not collusive or sham; that the Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any Bidder or person, to submit a sham bid or to refrain from bidding; and
5. That the bid has not in any manner, directly or indirectly, sought, by agreement or collusion, or communication or conference, with any person, to fix the bid price of the Bidder or of any other Bidder; and
6. That all statements in this proposal are true; and
7. That the individual(s) executing this proposal have the authority to execute this proposal on behalf of the Bidder.

PROPOSAL: PART F – ADDITIONAL REQUIREMENTS

The Bidder hereby agrees to comply with the additional requirements listed below which are included in this proposal and identified as proposal attachments:

ITEM NO.	DESCRIPTION OF ATTACHMENT
1.	None

PROPOSAL: PART G - IDENTITY OF BIDDER

The Bidder shall indicate whether the bid is submitted by a/an:

- ☐ Individual,
Sole Proprietorship
- ☐ Partnership
- ☐ Corporation
- ☐ Limited Liability Company
- ☐ Joint-Venture; all parties must join-in and
execute all documents
- ☐ Other

Bidder

Signature

Name (Print/Type)

Title

Street Address

City, State, Zip Code

Telephone Number

E-Mail Address

The Bidder shall enter its
Public Registration Number

issued by the Iowa Commissioner of Labor
Pursuant Section 91C.5 of the Iowa Code.

Failure to provide said Registration
Number shall result in the bid being read
under advisement. A contract will not be
executed until the contractor is registered.

**Type or print the name and title of the company's
owner, president, CEO, etc. if a different person
than entered above.**

Name

Title

NOTE: The signature on this proposal must be an original signature in ink; copies, facsimiles, or electronic signatures will not be accepted.

All bidders must submit the following completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156.

BIDDER STATUS FORM

To be completed by all bidders.

Part A

Please answer "Yes" or "No" for each of the following:

- ☐ Yes ☐ No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).
- ☐ Yes ☐ No My company has an office to transact business in Iowa.
- ☐ Yes ☐ No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
- ☐ Yes ☐ No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.
- ☐ Yes ☐ No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.
- If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.
- If you answered "No" to one or more questions above, your company is a non-resident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders.

Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

You may attach additional sheet(s) if needed.

To be completed by non-resident bidders.

Part C

- Name of home state or foreign country reported to the Iowa Secretary of State: _____
- Does your company's home state or foreign country offer preferences to bidders who are residents? ☐ Yes ☐ No
- If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all bidders.

Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

WORKSHEET: AUTHORIZATION TO TRANSACT BUSINESS

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- ☐ Yes ☐ No My business is currently registered as a contractor with the Iowa Division of Labor.
- ☐ Yes ☐ No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
- ☐ Yes ☐ No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- ☐ Yes ☐ No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- ☐ Yes ☐ No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa Secretary of State, has filed its most recent biennial report with the Secretary of State, and has neither received a certificate of withdrawal from the Secretary of state nor had its authority revoked.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- ☐ Yes ☐ No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa Secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

PROPOSAL ATTACHMENT: PART C – BID ITEMS AND QUANTITIES

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

This is a UNIT PRICE CONTRACT. The Bidder must provide the Unit Bid Price, the Total Bid Price, any Alternate Prices, and the Total Construction Costs on the Proposal Attachment: Part C – Bid Items and Quantities. In case of discrepancy, the Unit Bid Price governs. The quantities shown on the Proposal Attachment: Part C – Bid Items and Quantities are approximate only, but are considered sufficiently adequate for the purpose of comparing bids.

Base Bid Items

ESTIMATED PROJECT QUANTITIES – BASE BID					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	VAULT - DEMO VAULT TOP	SY	253	\$	\$
2	VAULT - DEMO STAIRS	SF	32	\$	\$
3	VAULT - INFILL OPENING, SINGLE WYTHER, 10 INCH	SF	17	\$	\$
4	VAULT - INFILL OPENING, SINGLE WYTHER, 12 INCH	SF	102	\$	\$
5	VAULT - INFILL OPENING, DOUBLE WYTHER, 24 INCH	SF	44	\$	\$
6	VAULT - WALL OPENING INFILL, 12" CMU	SF	66	\$	\$
7	VAULT - WALL OPENING INFILL, CONCRETE	CF	30	\$	\$
8	VAULT - CMU BLOCK WALL, 12 INCH	SF	143	\$	\$
9	VAULT - CAST IN PLACE WALL AND DOOR INFILL	CY	4.6	\$	\$
10	VAULT - WALL FOOTING UNDER NEW WALL	CY	7.4	\$	\$
11	VAULT - WATERPROOF WALL	SF	1255	\$	\$
12	VAULT - DRILLING HOLES IN CONCRETE FLOOR	EA	59	\$	\$
13	VAULT - GRANULAR FILL	CY	486	\$	\$
14	VAULT - STAIR REPLACEMENT	EA	2	\$	\$
15	VAULT - STRUCTURAL SIDEWALK	SY	5.6	\$	\$
16	COLLAPSIBLE BOLLARD	EA	4	\$	\$
17	BOLLARD	EA	1	\$	\$

18	GATEWAY MONUMENT ARCH	LS	1	\$	\$
19	BENCH (FURNISH AND INSTALL)	EA	3	\$	\$
20	BENCH (INSTALL ONLY)	EA	3	\$	\$
21	LITTER RECEPTACLE (INSTALL ONLY)	EA	9	\$	\$
22	BIKE RACK (INSTALL ONLY)	EA	3	\$	\$
23	FLAG POLE	EA	2	\$	\$
24	PLANTER POT, 36" X 36"	EA	10	\$	\$
25	PLANTER POT, 42" X 42"	EA	10	\$	\$
26	STANDING HEIGHT TABLE	EA	5	\$	\$
27	CAST STONE SEATWALL TYPE 'A'	LF	60	\$	\$
28	CAST STONE SEATWALL TYPE 'B'	LF	152	\$	\$
29	ELECTRICAL WIRING, CONDUIT, AND DISTRIBUTION PEDESTALS	LS	1	\$	\$
30	HANDHOLE (HH-1 AND HH-2)	EA	13	\$	\$
31	HANDHOLE (HH-3)	EA	1	\$	\$
32	TYPE S1, S1A, S1B LIGHT POLE ASSEMBLY	EA	25	\$	\$
33	TYPE S2A, S2B, S2C, S2D LIGHT POLE ASSEMBLY	EA	8	\$	\$
34	TYPE S2 LIGHT POLE ASSEMBLY	EA	16	\$	\$
35	TYPE S3 LIGHT POLE ASSEMBLY	EA	8	\$	\$
36	TYPE S3C, S3D LIGHT POLE ASSEMBLY	EA	2	\$	\$
37	TYPE S4 LIGHT POLE ASSEMBLY	EA	2	\$	\$
38	TYPE S3F CATENARY LIGHTING ASSEMBLY	LS	1	\$	\$
39	LIGHT POLE FOUNDATION	EA	61	\$	\$
40	EVENT POWER PEDESTAL (PED-1)	EA	2	\$	\$
41	TREE PROTECTION	EA	6	\$	\$
42	REMOVE AND REINSTALL LINCOLN HIGHWAY MARKER	EA	1	\$	\$
43	CONCRETE PLANTING BED EDGE	LF	75	\$	\$

44	CLEARING AND GRUBBING	LS	1	\$	\$
45	AMENDED PLANTING SOIL	CY	277	\$	\$
46	TOPSOIL, OFF-SITE, 8 INCH	CY	375	\$	\$
47	STRUCTURAL SOIL (TREE PLANTING)	CY	722	\$	\$
48	EXCAVATION, CLASS 13	CY	5350	\$	\$
49	SUBGRADE PREPARATION, 12 INCH	SY	13345	\$	\$
50	GRANULAR STABILIZATION	TON	1220	\$	\$
51	SUBGRADE TREATMENT, MULTIAXIAL GEO-GRID	SY	13345	\$	\$
52	SUBBASE, MODIFIED, 4 INCHES	SY	8063	\$	\$
53	SUBBASE, MODIFIED, 6 INCHES	SY	253	\$	\$
54	SUBBASE, MODIFIED, 8 INCHES	SY	13345	\$	\$
55	REMOVAL OF STRUCTURE, ELECTRICAL METER	EA	2	\$	\$
56	REMOVAL OF STRUCTURE, LIGHT POLE FOOTING	EA	34	\$	\$
57	REMOVAL OF STRUCTURE, HANDHOLE	EA	0	\$	\$
58	REMOVAL OF STRUCTURE, FLAG POLE	EA	2	\$	\$
59	REMOVAL OF STRUCTURE, MISC. SITE FURNISHINGS	LS	1	\$	\$
60	TROLLEY TRACK REMOVAL	LF	1400	\$	\$
61	COMPACTION TESTING	LS	1	\$	\$
62	EXPLORATORY EXCAVATION	HR	40	\$	\$
63	TRENCH FOUNDATION	TON	200	\$	\$
64	REPLACEMENT OF UNSUITABLE BACKFILL MATERIAL	CY	400	\$	\$
65	TRENCH COMPACTION TESTING	LS	1	\$	\$
66	DISPOSAL OF CONTAMINATED SOIL	TON	991	\$	\$
67	DISPOSAL OF CONTAMINATED GROUND WATER	GAL	500	\$	\$
68	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$	\$
69	STORM SEWER, TRENCHED, PVC, 2 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$	\$

70	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$	\$
71	STORM SEWER, TRENCHED, PVC, 4 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$	\$
72	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$	\$
73	STORM SEWER, TRENCHED, PVC, 6 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$	\$
74	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - SHORT SIDE	EA	1	\$	\$
75	STORM SEWER, TRENCHED, PVC, 8 INCH (SUMP PUMP CONNECTION) - LONG SIDE	EA	1	\$	\$
76	STORM SEWER, TRENCHED, PVC, 10 INCH	LF	92	\$	\$
77	STORM SEWER, TRENCHED, PVC, 12 INCH	LF	150	\$	\$
78	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	1341	\$	\$
79	STORM SEWER, TRENCHED, RCP, 24 INCH	LF	444	\$	\$
80	STORM SEWER, TRENCHED, RCP, 36 INCH	LF	502	\$	\$
81	REMOVAL OF STORM SEWER, 36 INCH OR LESS	LF	1047	\$	\$
82	SUBDRAIN, TYPE 1C, PVC, 6 INCH	LF	1984	\$	\$
83	SUBDRAIN CLEANOUT, TYPE A-1, 6 INCH	EA	2	\$	\$
84	SUBDRAIN OUTLETS AND CONNECTIONS	EA	30	\$	\$
85	WATER MAIN, TRENCHED, DIP WITH NITRILE GASKETS, 8 INCH	LF	2553	\$	\$
86	FITTING, DUCTILE IRON	LB.	3983	\$	\$
87	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, SHORT SIDE	EA	1	\$	\$
88	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 4 INCH, LONG SIDE	EA	2	\$	\$
89	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	5	\$	\$
90	WATER SERVICE PIPE, DIP, FIRE PROTECTION, 6 INCH, LONG SIDE	EA	4	\$	\$
91	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	5	\$	\$
92	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, SHORT SIDE	EA	2	\$	\$
93	WATER SERVICE PIPE, DIP, EXTERNAL FIRE PROTECTION WITH HYDRANT, 6 INCH, LONG SIDE	EA	2	\$	\$
94	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, SHORT SIDE	EA	6	\$	\$
95	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION, 6 INCH, LONG SIDE	EA	3	\$	\$

96	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, SHORT SIDE	EA	4	\$	\$
97	WATER SERVICE PIPE, DIP, INTERNAL FIRE PROTECTION WITH DOMESTIC SERVICE, 6 INCH, LONG SIDE	EA	1	\$	\$
98	WATER SERVICE PIPE, COPPER, 3/4 INCH, SHORT SIDE	EA	7	\$	\$
99	WATER SERVICE PIPE, COPPER, 3/4 INCH, LONG SIDE	EA	5	\$	\$
100	WATER SERVICE PIPE, COPPER, 1 INCH, SHORT SIDE	EA	9	\$	\$
101	WATER SERVICE PIPE, COPPER, 1 INCH, LONG SIDE	EA	3	\$	\$
102	WATER SERVICE PIPE, COPPER, 1 1/4 INCH, SHORT SIDE	EA	3	\$	\$
103	WATER SERVICE PIPE, COPPER, 1 1/4 INCH, LONG SIDE	EA	1	\$	\$
104	WATER SERVICE PIPE, COPPER, 1 1/2 INCH, SHORT SIDE	EA	1	\$	\$
105	WATER SERVICE PIPE, COPPER, 1 1/2 INCH, LONG SIDE	EA	1	\$	\$
106	WATER SERVICE PIPE, COPPER, 1 3/4 INCH, SHORT SIDE	EA	1	\$	\$
107	WATER SERVICE PIPE, COPPER, 1 3/4 INCH, LONG SIDE	EA	2	\$	\$
108	WATER SERVICE PIPE, COPPER, 2 INCH, SHORT SIDE	EA	3	\$	\$
109	WATER SERVICE PIPE, COPPER, 2 INCH, LONG SIDE	EA	1	\$	\$
110	WATER SERVICE PIPE, COPPER, 2 1/2 INCH, SHORT SIDE	EA	1	\$	\$
111	WATER SERVICE PIPE, COPPER, 2 1/2 INCH, LONG SIDE	EA	1	\$	\$
112	WATER SERVICE CURB STOP AND BOX	EA	38	\$	\$
113	WATER MAIN REMOVAL	LF	2388	\$	\$
114	VALVE, GATE, 4 INCH, FIRE SERVICE	EA	2	\$	\$
115	VALVE, GATE, 6 INCH, FIRE SERVICE	EA	30	\$	\$
116	VALVE, GATE, 8 INCH	EA	12	\$	\$
117	INSERTION VALVE, 6 INCH	EA	2	\$	\$
118	INSERTION VALVE, 8 INCH	EA	2	\$	\$
119	LINE STOP, 8 INCH	EA	4	\$	\$
120	LINE STOP, 10 INCH	EA	1	\$	\$

121	FIRE HYDRANT ASSEMBLY	EA	8	\$	\$
122	FLUSHING DEVICE (TEMPORARY BLOWOFF DEVICE)	EA	12	\$	\$
123	FIRE HYDRANT ASSEMBLY REMOVAL	EA	4	\$	\$
124	VALVE REMOVAL	EA	22	\$	\$
125	STORM MANHOLE, SW-401, 48 INCH	EA	1	\$	\$
126	STORM MANHOLE, SW-401, 84 INCH	EA	1	\$	\$
127	INTAKE, SW-501	EA	6	\$	\$
128	INTAKE, SW-503	EA	1	\$	\$
129	INTAKE, SW-505	EA	14	\$	\$
130	INTAKE, SW-506	EA	4	\$	\$
131	INTAKE, SW-507	EA	3	\$	\$
132	INTAKE, SW-541, MODIFIED	EA	3	\$	\$
133	MANHOLE ADJUSTMENT, MINOR	EA	1	\$	\$
134	CONNECTION TO EXISTING MANHOLE	EA	0	\$	\$
135	REMOVE MANHOLE	EA	8	\$	\$
136	REMOVE INTAKE	EA	16	\$	\$
137	PAVEMENT, PCC, 8 INCH, C4WRC20	SY	11778	\$	\$
138	PLANTER CURB	LF	2433	\$	\$
139	PCC PAVEMENT SAMPLES AND TESTING	LS	1	\$	\$
140	REMOVAL OF SIDEWALK	SY	6738	\$	\$
141	REMOVAL OF DRIVEWAY	SY	405	\$	\$
142	SIDEWALK, PCC, 5 INCH	SY	5463	\$	\$
143	SIDEWALK, PCC, 6 INCH	SY	494	\$	\$
144	CROSSWALK UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE	SF	3001	\$	\$
145	ROADWAY UNIT PAVERS WITH ASPHALT SETTING BED & PCC BASE	SF	2294	\$	\$
146	SIDEWALK UNIT PAVERS WITH SAND SETTING BED & PCC BASE	SF	12679	\$	\$

147	DETECTABLE WARNING	SF	453	\$	\$
148	DRIVEWAY, PAVED, PCC, 7 INCH	SY	152	\$	\$
149	DRIVEWAY, PAVED, PCC, 8 INCH (ALLEY)	SY	168	\$	\$
150	SIDEWALK ASSURANCE TESTING	LS	1	\$	\$
151	DRIVEWAY ASSURANCE TESTING	LS	1	\$	\$
152	PAVEMENT REMOVAL	SY	12700	\$	\$
153	PAINTED PAVEMENT MARKINGS, SOLVENT/WATERBORNE	STA	150	\$	\$
154	PAINTED SYMBOLS AND LEGENDS	EA	8	\$	\$
155	TEMPORARY TRAFFIC CONTROL	LS	1	\$	\$
156	TEMPORARY TRAFFIC CONTROL - PEDESTRIAN ACCESS	LS	1	\$	\$
157	REMOVE AND SALVAGE TRAFFIC SIGN ASSEMBLY	EA	42	\$	\$
158	SOD	SQ	139	\$	\$
159	PLANTS WITH WARRANTY, DECIDUOUS SHRUB, (#5 CONT)	EA	21	\$	\$
160	PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL)	EA	2516	\$	\$
161	PLANTS WITH WARRANTY, DECIDUOUS TREE	EA	54	\$	\$
162	RUBBER MULCH	CY	46	\$	\$
163	IRRIGATION SYSTEM	LS	1	\$	\$
164	SWPPP PREPARATION	LS	1	\$	\$
165	SWPPP MANAGEMENT	LS	1	\$	\$
166	WATTLE, STRAW, 9 INCH	LF	2800	\$	\$
167	STABILIZED CONSTRUCTION ENTRANCE	EA	1	\$	\$
168	INLET PROTECTION DEVICE	EA	58	\$	\$
169	CONSTRUCTION SURVEY	LS	1	\$	\$
170	MONUMENT PRESERVATION AND REPLACEMENT	LS	1	\$	\$
171	MOBILIZATION	LS	1	\$	\$
172	MAINTENANCE OF POSTAL SERVICE	LS	1	\$	\$

173	TEMPORARY GRANULAR SIDEWALK	SY	400	\$	\$
174	TEMPORARY LONGITUDINAL CHANNELIZING DEVICE	LF	4430	\$	\$
175	CONCRETE WASHOUT	LS	1	\$	\$
TOTAL AMOUNT BASE BID:				\$	

**ESTIMATED PROJECT QUANTITIES - BID ALTERNATE #1 -
MCSD WELCOME CENTER PARKING LOT RECONSTRUCTION**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1001	Bollard	EA	2	\$	\$
1002	Bollard, Decorative	EA	1	\$	\$
1003	Cast Stone Seatwall 'A'	LF	78	\$	\$
1004	Electrical Wiring and Conduit	LS	1	\$	\$
1005	Handhole (HH-2)	EA	1	\$	\$
1006	S4 Light Pole Assembly	EA	2	\$	\$
1007	Light Pole Foundation	EA	2	\$	\$
1008	Remove and Reinstall Street Sign	EA	1	\$	\$
1009	Structural Soil (Tree Planting)	CY	80	\$	\$
1010	Topsoil, Off-Site, 8 Inch	CY	43	\$	\$
1011	Excavation, (Class 10)	LS	1	\$	\$
1012	Subgrade Preparation, 12 Inch	SY	1,550	\$	\$
1013	Subbase, (Modified), 4 Inches	SY	135	\$	\$
1014	Subbase, (Modified), 6 Inches	SY	1,550	\$	\$
1015	Storm Sewer, Trenched, RCP, 12 Inch	LF	72	\$	\$
1016	Intake, Single Grate (SW-501)	EA	1	\$	\$
1017	Pavement, PCC, 6 Inch	SY	1,517	\$	\$
1019	Planter Curb	LF	93	\$	\$
1020	Curb and Gutter, 30"x6"	LF	47	\$	\$
1021	Removal of Sidewalk	SY	216	\$	\$
1022	Removal of Driveway	SY	20	\$	\$
1023	Sidewalk, PCC, 4 Inch	SY	210	\$	\$
1024	Sidewalk Unit Pavers with Sand Setting Bed & PCC Base	SF	145	\$	\$
1025	Detectable Warnings	SF	20	\$	\$
1026	Driveway, Paved, PCC 8 Inch	SY	33	\$	\$
1027	Pavement Removal	SY	1789	\$	\$
1028	Curb and Gutter Removal	LF	166	\$	\$
1029	Painted Pavement Markings, Solvent/Waterborne	STA	7.8	\$	\$
1030	Painted Symbols and Legends	EA	2	\$	\$
1031	Plants with Warranty, Deciduous Shrub	EA	77	\$	\$

1032	Plants with Warranty, Deciduous Tree	EA	12	\$	\$
1033	Rubber Mulch	CY	20	\$	\$
1034	Wattle, Straw, 9 Inch	LF	265	\$	\$
1035	Stabilized Construction Entrance	EA	1	\$	\$
1036	Inlet Protection Device	EA	1	\$	\$
1037	Mobilization	LS	1	\$	\$
TOTAL AMOUNT BID ALTERNATIVE #1:				\$	

**ESTIMATED PROJECT QUANTITIES - BID ALTERNATE #2 -
MCSD WELCOME CENTER PARKING LOT RECONSTRUCTION**

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1011	Excavation, (Class 10)	LS	1	\$	\$
1012	Subgrade Preparation, 12 Inch	SY	373	\$	\$
1013	Subbase, (Modified), 4 Inches	SY	21	\$	\$
1014	Subbase, (Modified), 6 Inches	SY	373	\$	\$
1018	Pavement, PCC, 8 Inch	SY	348	\$	\$
1021	Removal of Sidewalk	SY	18	\$	\$
1022	Removal of Driveway	SY	36	\$	\$
1023	Sidewalk, PCC, 4 Inch	SY	21	\$	\$
1025	Detectable Warnings	SF	20	\$	\$
1026	Driveway, Paved, PCC 8 Inch	SY	24	\$	\$
1027	Pavement Removal	SY	336	\$	\$
1037	Mobilization	LS	1	\$	\$
TOTAL AMOUNT BID ALTERNATIVE #2:				\$	

NOTE: IT IS UNDERSTOOD THAT THE ABOVE QUANTITIES ARE ESTIMATED FOR THE PURPOSE OF THIS BID. ALL QUANTITIES ARE SUBJECT TO REVISION BY THE JURISDICTION AS NOTED IN SECTION 00500 - "CONTRACT" OF THIS PROJECT MANUAL.

Bidder Name

SECTION 00420 - BID BOND

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal, and
_____, as Surety, are held and firmly bound unto,
City of Marshalltown as Obligee, (hereinafter referred to as "the Jurisdiction"), in the penal sum of _____
dollars (\$_____), lawful money of the United States,
for which payment said Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns
jointly and severally, firmly by these presents.

The condition of the above obligation is such that whereas the Principal has submitted to the Jurisdiction a certain proposal,
in a separate envelope, and hereby made a part hereof, to enter into a contract in writing, for the following project:

Project Title: Main Street Reconstruction

Project Description: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center
Street from State Street to Church Street.

The Surety hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or
affected by any extension of the time within which the Jurisdiction may accept such bid or execute such Contract; and said
Surety does hereby waive notice of any such extension.

In the event that any actions or proceedings are initiated with respect to this Bond, the parties agree that the venue thereof
shall be Story County, State of Iowa. If legal action is required by the Jurisdiction against the Surety or Principal to enforce
the provisions of the bond or to collect the monetary obligation incurring to the benefit of the Jurisdiction, the Surety or
Principal agrees to pay the Jurisdiction all damages, costs, and attorney fees incurred by enforcing any of the provisions of
this Bond. All rights, powers, and remedies of the Jurisdiction hereunder shall be cumulative and not alternative and shall
be in addition to all rights, powers, and remedies given to the Jurisdiction, by law. The Jurisdiction may proceed against
Surety for any amount guaranteed hereunder whether action is brought against Principal or whether Principal is joined in
any such action or actions or not.

NOW, THEREFORE, if said proposal by the Principal be accepted, and the Principal shall enter into a contract with
Jurisdiction in accordance with the terms of such proposal, including the provision of insurance and of a bond as may be
specified in the contract documents, with good and sufficient surety for the faithful performance of such contract, for the
prompt payment of labor and material furnished in the prosecution thereof, and for the maintenance of said improvements
as may be required therein, then this obligation shall become null and void; otherwise, the Principal shall pay to the
Jurisdiction the full amount of the bid bond, together with court costs, attorney's fees, and any other expense of recovery.

Signed and sealed this _____ day of _____, 20_____.

SURETY:

PRINCIPAL:

Surety Company

Bidder

By:

Signature Attorney-in-Fact/Officer

By:

Signature

Name of Attorney-in-Fact/Officer

Name (Print/Type)

Company Name

Title

Company Address

Address

City, State, Zip Code

City, State, Zip Code

Company Telephone Number

Telephone Number

Company E-Mail

E-Mail

NOTE: All signatures on this bid bond must be original signatures in ink; electronic, copies or facsimile of any signature will not be accepted. This bond must be sealed with the Surety's raised, embossing seal or official adhesive seal. The Certificate or Power of Attorney accompanying this bond must be valid on its face and sealed with the Surety's raised, embossing seal or official adhesive seal.

SECTION 00450 - INFORMATION REQUESTED FROM THE LOW BIDDER

(The low bidder may be requested to provide this information after the bids are received, but prior to issuing the "Notice of Award".)

GENERAL INFORMATION

The low bidder is requested to furnish the following information. Additional sheets shall be attached as required.

Contractor's Name and Address: _____

Number of years as a contractor in construction work of this type: _____

Names and titles of all officers of Contractor's firm: _____

SUBMIT a list of five construction contracts completed by the contractor during the last five years involving work of similar type and comparable value. The list shall include the following information as a minimum:

- Name, address and telephone number of owner;
- Name of project;
- Location of project;
- Brief description of the work involved;
- Contract amount;
- Date of completion of contract;
- Name, address and telephone number of architect or engineer; and
- Name of owner's project engineer.

EQUIPMENT/MATERIAL SOURCE INFORMATION

The low bidder is requested to list the name of the manufacturer of supplier and catalog numbers of the equipment or material proposed to be furnished under the bid. Awarding of a contract under this bid will not imply approval by the Owner of the manufacturers or suppliers listed by the low bidder.

****END OF SECTION****

SECTION 00500 - CONTRACT

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

THIS CONTRACT, made and entered into this _____ day of _____, 20____, by and between the City of Marshalltown hereinafter called the "Jurisdiction", and _____
hereinafter called the "Contractor".

WITNESSETH:

The Contractor hereby agrees to complete the work comprising the Main Street Reconstruction as specified in the contract documents, which are officially on file with the Jurisdiction, in the office of the Clerk, City of Marshalltown, 24 N. Center Street, Marshalltown, Iowa. This Contract includes all such contract documents. All work under this Contract shall be constructed in accordance with the SUDAS Standard Specifications, 2024 Edition and as further modified by the Special Provisions, Technical Specifications and Supplemental Specifications included in said contract documents and the Contract Attachment which is attached hereto. The Contractor further agrees to complete the work in strict accordance with said contract documents, and to guarantee the work as required by law for the time required in said contract documents after its acceptance by the Jurisdiction.

This Contract is awarded and executed for completion of the work specified in the contract documents for the bid prices shown on the Contract Attachment: Bid Items and Quantities which were proposed by the Contractor in its Proposal submitted in accordance with the Notice to Bidders and Notice of Public Hearing for the following project:

Project Title: Main Street Reconstruction

Project Description: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center Street from State Street to Church Street.

The Contractor agrees to perform said work for and in consideration of the Jurisdiction's payment of the bid amount of _____ dollars (\$ _____), which amount shall constitute the required amount of the Performance, Payment and Maintenance Bond. The Contractor hereby agrees to commence work as stated in the written Notice to Proceed; and substantially complete the work in accordance with the following contract provisions:

CONTRACT PROVISIONS

A. Completion Date: Date

1. The work will be substantially completed on or before December 11, 2026, and completed and ready for final payment in accordance with General Conditions on or before December 30, 2026 and pay liquidated damages for noncompliance in the amount of two-thousand and no/100 dollars (\$2,000) for each calendar day thereafter for substantial completion and pay liquidated damages for noncompliance in the amount of one-thousand one hundred dollars (\$1,100) for each calendar day thereafter for final completion.

- #### B. Interim Completion Dates: Undertake and schedule work in compliance with the intermediate completion provisions described below. The work to be completed by the intermediate completion period shall be such work as required to satisfy the intermediate completion period description

The Bidder hereby agrees to:

1. Intermediate Completion Provision No. 1 (Completion Date Requirement):

Contractor shall complete all work included in Phase #1 (excluding sodding), as detailed on the J sheets of the project plans, by Friday, August 15, 2025. Noncompliance with said Intermediate Completion Provision #1 shall result in payment of liquidated damages with said completion provisions in the amount of one thousand and eight hundred dollars (\$1,800) per calendar day will be assessed for each day after August 15, 2025, that all work is not completed in accordance with the above described Intermediate Completion Date #1 provision and description. No work on phase 2 can begin until phase 1 is completed.

2. Intermediate Completion Provision No. 2 (Completion Date Requirement):

Contractor shall complete all work included in Phase #2 (excluding sodding), as detailed on the J sheets of the project plans, by Friday, December 12, 2025. Noncompliance with said Intermediate Completion Provision #2 shall result in payment of liquidated damages with said completion provisions in the amount of one thousand and eight hundred dollars (\$1,800) per calendar day will be assessed for each day after December 12, 2025, that all work is not completed in accordance with the above described Intermediate Completion Date #2 provision and description. Phase #2 shall not be allowed to start until Phase #1 is complete and fully open to traffic and pedestrian activity.

3. Intermediate Completion Provision No. 3 (Calendar Day Completion Requirement):

Contractor shall complete all work included in Phase #3.1 (excluding sodding), as detailed on the J sheets of the project plans, within 60 calendar days. Calendar days shall start the day that the roadway is closed to traffic and shall stop on the day the intersection of Main St. and 1st Ave is opened to traffic. In order to open to traffic all underground utilities, roadway paving, sidewalk paving and paver installation but be completed. Noncompliance with said Intermediate Completion Provision #3 shall result in payment of liquidated damages with said completion provisions in the amount of one thousand and eight hundred dollars (\$1,800) per calendar day will be assessed for each day after 60 Calendar days, that all work is not completed in accordance with the above described Intermediate Completion Date #2 provision and description.

4. Intermediate Completion Provision No. 4 (Calendar Day Requirement) - Sidewalks:

Contractor shall maintain access to every business at all times except as specified in the contract. Properties with no paver bands in front of them shall be shut down for a maximum of 4 days with a maximum of 2 consecutive days shut down in a row. Properties with paver bands in front of them shall be shut down for a maximum of 6 days with a maximum of 2 consecutive days shut down in a row. Noncompliance with said Intermediate Completion Provision #4 shall result in payment of liquidated damages with said completion provisions in the amount of nine hundred dollars (\$900) per calendar day will be assessed for each day access is not maintained beyond the maximum days listed above.

5. Intermediate Completion Provision No. 5 (Calendar Day Requirement) – Water Service:

Contractor shall maintain access to every business at all times except as specified in the contract. Properties shall be shut down for a maximum of 2 business days for water service connections including both domestic and fire within the 2 days. Noncompliance with said Intermediate Completion Provision #5 shall result in payment of liquidated damages with said completion provisions in the amount of nine hundred dollars (\$900) per calendar day will be assessed for each day access is not maintained beyond the maximum days listed above.

6. Intermediate Completion Provision No. 6 (Calendar Day Requirement):

Contractor shall complete all work involved with each known vault repairs in the following time periods. 24 E Main street shall be completed in 10 calendar days, 16 E Main street shall be completed in 17 calendar days, 19 S Centers shall be completed in 12 calendar days, 210 E. Main Street shall be completed in 10 calendar days, 4 E. Main Street shall be completed 5 calendar days . Noncompliance with said Intermediate Completion Provision #6 shall result in payment of liquidated damages with said completion provisions in the amount of nine hundred dollars (\$900) per calendar day per property will be assessed for each day beyond the calendar dates listed above. Liquidated damages can be applied to multiple vaults at the same time independently.

C. Maintenance Bond & Warranty

1. To remedy any and all defects that may develop in or result from work to be performed under the Contract within the City of Marshalltown, from the date of acceptance of the work under the Contract, by reason of defects in workmanship or materials used in construction of said work.
2. Shall also guarantee the maintenance of the improvement caused by failures in materials and construction for a period of 4 years from and after acceptance of the work.

D. Bid Quantity Revisions

1. All quantities are estimates and subject to revision by the Jurisdiction.
2. Quantity changes that do not materially change the character of the work to be performed and amount to less than Twenty (20) percent of a given bid item or less than Five (5) percent of the total contract amount shall not affect the unit price bid.

IN WITNESS WHEREOF, the Parties hereto have executed this instrument, in triplicate on the date first shown written.

JURISDICTION: City of Marshalltown

CONTRACTOR:

By: _____
Joel Greer, Mayor

Company Name

(Seal)
ATTEST:

Signature

By: _____
Alicia Hunter, Clerk

Name (Print/Type)

Title

Street Address

City, State, Zip Code

Telephone

E-Mail

CONTRACTOR PUBLIC REGISTRATION INFORMATION to be Provided By:

1. All Contractors: The Contractor shall enter its Public Registration No. _____ issued by the Iowa Commissioner of Labor pursuant to Section 91C.5 of the Iowa Code.
2. Out-of-State Contractors:
 - A. Pursuant to Section 91C.7 of the Iowa Code, an out-of-state contractor, before commencing a contract in excess of five thousand dollars in value in Iowa, shall file a bond with the division of labor services of the department of workforce development. The Contractor should contact 515-242-5871 for further information. Prior to contract execution, the Jurisdictional Engineer may forward a copy of this contract to the Iowa Department of Workforce Development as notification of pending construction work. It is the Contractor's responsibility to comply with said Section 91C.7 before commencing this work.
 - B. Prior to entering into contract, the designated low bidder, if it is a corporation organized under the laws of a state other than Iowa, shall file with the Jurisdictional Engineer a certificate from the Secretary of the State of Iowa showing that it has complied with all the provisions of Chapter 490 of the Code of Iowa, as amended, governing foreign corporations. For further information contact the Iowa Secretary of State Office at 515-281-5204.

Bond No. _____
Name of Surety _____

NOTE: All signatures on this contract must be original signatures in ink; electronic, copies or facsimile of any signature will not be accepted.

CORPORATE ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me, the undersigned, a Notary Public in and for the State of _____, personally appeared _____ and _____, to me known, who, being by me duly sworn, did say that they are the _____, and _____, respectively, of the corporation executing the foregoing instrument; that (no seal has been procured by) (the seal affixed thereto is the seal of) the corporation; that said instrument was signed (and sealed) on behalf of the corporation by authority of the Board of Directors; that _____ and _____ acknowledged the execution of the instrument to be the voluntary act and deed of the corporation, by it and by them voluntarily executed.

Notary Public in and for the State of _____
My commission expires _____, 20_____

PARTNERSHIP ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me, the undersigned, a Notary Public in and for the State of _____, personally appeared _____ to me personally known, who being by me duly sworn, did say that the person is one of the partners of _____, a partnership, and that the instrument was signed on behalf of the partnership by authority of the partners and the partner acknowledged the execution of the instrument to be the voluntary act and deed of the partnership by it and by the partner voluntarily executed.

Notary Public in and for the State of _____
My commission expires _____, 20_____

INDIVIDUAL ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me, the undersigned, a Notary Public in and for the State of _____, personally appeared _____ and _____, to me known to be the identical person(s) named in and who executed the foregoing instrument, and acknowledged that (he) (she) (they) executed the instrument as (his) (her) (their) voluntary act and deed.

Notary Public in and for the State of _____
My commission expires _____, 20_____

LIMITED LIABILITY COMPANY ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me a Notary Public in and for said State, personally appeared _____, to me personally known, who being by me duly sworn did say that person is _____ of said _____, that (the seal affixed to said instrument is the seal of said _____ OR no seal has been procured by the said) _____, and that said instrument was signed and sealed on behalf of the said _____, by authority of its managers and the said _____ acknowledged the execution of said instrument to be the voluntary act and deed of said _____, by it voluntarily executed.

Notary Public in and for the State of _____
My commission expires _____, 20_____

CONTRACT ATTACHMENT: ITEM 1: GENERAL – NONE

CONTRACT ATTACHMENT: ITEM 2: BID ITEMS AND, QUANTITIES

THIS CONTRACT IS AWARDED AND EXECUTED FOR COMPLETION OF THE WORK SPECIFIED IN THE CONTRACT DOCUMENTS FOR THE BID PRICES TABULATED BELOW AS PROPOSED BY THE CONTRACTOR IN ITS PROPOSAL SUBMITTED IN ACCORDANCE WITH NOTICE TO BIDDERS AND NOTICE OF PUBLIC HEARING. ALL QUANTITIES ARE SUBJECT TO REVISION BY THE JURISDICTION. THE JURISDICTION RESERVES THE RIGHT TO ADJUST QUANTITIES AS NECESSARY TO MAXIMIZE FUNDS BUDGETED FOR THIS PROJECT AS NOTED IN SECTION 00500 – CONTRACT.

[Insert Schedule of Unit Prices Standard Table Format]

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SECTION 00610 - PERFORMANCE, PAYMENT AND MAINTENANCE BOND

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal (hereinafter the "Contractor" or "Principal") and _____, as Surety are held and firmly bound unto _____, as Oblige (hereinafter referred to as "the Jurisdiction"), and to all persons who may be injured by any breach of any of the conditions of this Bond in the penal sum of _____ DOLLARS (\$ _____), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, legal representatives and assigns, jointly or severally, firmly by these presents.

The conditions of the above obligations are such that whereas said Contractor entered into a contract with the Jurisdiction, bearing date the _____ day of _____, _____, hereinafter the "Contract" wherein said Contractor undertakes and agrees to construct the Main Street Reconstruction, Marshalltown, Iowa.

Project Description: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center Street from State Street to Church Street.

And to faithfully perform all the terms and requirements of said Contract within the time therein specified, in a good and workmanlike manner, and in accordance with the Contract documents. Provided, however, that one year after the date of acceptance as complete of the work under the above referenced Contract, the maintenance portion of this Bond shall continue in force for the stated maintenance period.

It is expressly understood and agreed by the Contractor and Surety in this Bond that the following provisions are a part of this Bond and are binding upon said Contractor and Surety, to-wit:

PERFORMANCE: The Contractor shall well and faithfully observe, perform, fulfill, and abide by each and every covenant, condition, and part of said Contract and Contract Documents, by reference made a part hereof, for the above referenced improvements and shall indemnify and save harmless the Jurisdiction from all outlay and expense incurred by the Jurisdiction by reason of the Contractor's default of failure to perform as required. The Contractor shall also be responsible for the default or failure to perform as required under the Contract and Contract Documents by all its subcontractors, suppliers, agents, or employees furnishing materials or providing labor in the performance of the Contract.

PAYMENT: The Contractor and the Surety on this Bond are hereby agreed to pay all just claims submitted by persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the performance of the Contract on account of which this Bond is given, including but not limited to claims for all amounts due for labor, materials, lubricants, oil, gasoline, repairs on machinery, equipment and tools, consumed or used by the Contractor or any subcontractor, wherein the same are not satisfied out of the portion of the contract price which the Jurisdiction is required to retain until completion of the improvement, but the Contractor and Surety shall not be liable to said persons, firms, or corporations unless the claims of said claimants against said portion of the contract price shall have been established as provided by law. The Contractor and Surety hereby bind themselves to the obligations and conditions set forth in Chapter 573, Code of Iowa, which by this reference is made a part hereof as though fully set out herein.

MAINTENANCE: The Contractor and the Surety on this Bond hereby agree, at their own expense:

To remedy any and all defects that may develop in or result from work to be performed under the Contract as detailed in Section 00500 - Contract, from the date of acceptance of the work under the Contract, by reason of defects in workmanship or materials used in construction of said work;

To keep all work in continuous good repair; and

To pay the Jurisdiction's reasonable costs of monitoring and inspection to assure that any defects are remedied and to repay the Jurisdiction all outlay and expense incurred as a result of Contractor's and Surety's failure to remedy any defect as required by this section.

Maintenance Bond requirements shall not apply to the following: work that is not permanently incorporated into the project; pavement markings, seeding, sodding, and plant material and planting.

Contractor's and Surety's agreement herein made extends to defects in workmanship or materials not discovered or known to the Jurisdiction at the time such work was accepted.

GENERAL: Every Surety on this Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:

To consent without notice to any extension of time to the Contractor in which to perform the Contract;

To consent without notice to any change in the Contract or Contract Documents, which thereby increases the total contract price and the penal sum of this Bond, provided that all such changes do not, in the aggregate, involve an increase of more than twenty percent of the total contract price, and that this Bond shall then be released as to such excess increase; and

To consent without notice that this Bond shall remain in full force and effect until the Contract is completed, whether completed within the specified contract period, within an extension thereof, or within a period of time after the contract period has elapsed and the liquidated damage penalty is being charged against the Contractor.

The Contractor and every Surety on the Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:

That no provision of this Bond or of any other contract shall be valid which limits to less than five years after the acceptance of the work under the Contract the right to sue on this Bond.

That as used herein, the phrase "all outlay and expense" is not to be limited in any way, but shall include the actual and reasonable costs and expenses incurred by the Jurisdiction including interest, benefits and overhead where applicable. Accordingly, "all outlay and expense" would include but not be limited to all contract or employee expense, all equipment usage or rental, materials, testing, outside experts, attorney's fees (including overhead expenses of the Jurisdiction's staff attorneys), and all costs and expenses of litigation as they are incurred by the Jurisdiction. It is intended the Contractor and Surety will defend and indemnify the Jurisdiction on all claims made against the Jurisdiction on account of Contractor's failure to perform as required in the Contract and Contract Documents, that all agreements and promises set forth in the Contract and Contract Documents, in approved change orders, and in this Bond will be fulfilled, and that the Jurisdiction will be fully indemnified so that it will be put into the position it would have been in had the Contract been performed in the first instance as required.

In the event the Jurisdiction incurs any "outlay and expense" in defending itself with respect to any claim as to which the Contractor or Surety should have provided the defense, or in the enforcement of the promises given by the Contractor in the Contract, Contract Documents, or approved change orders, or in the enforcement of the promises given by the Contractor and Surety in this Bond, the Contractor and Surety agree that they will make the Jurisdiction whole for all such outlay and expense, provided that the Surety's obligation under this Bond shall not exceed 125% of the penal sum of this Bond.

In the event that any actions or proceedings are initiated with respect to this Bond, the parties agree that the venue thereof shall be Story County, State of Iowa. If legal action is required by the Jurisdiction to enforce the provisions of this Bond or to collect the monetary obligation incurring to the benefit of the Jurisdiction, the Contractor and the Surety agree, jointly and severally, to pay the Jurisdiction all outlay and expense incurred therefor by the Jurisdiction. All rights, powers, and remedies of the Jurisdiction hereunder shall be cumulative and not alternative and shall be in addition to all rights, powers

and remedies given to the Jurisdiction, by law. The Jurisdiction may proceed against surety for any amount guaranteed hereunder whether action is brought against the Contractor or whether Contractor is joined in any such action(s).

NOW THEREFORE, the condition of this obligation is such that if said Principal shall faithfully perform all the promises of the Principal, as set forth and provided in the Contract, in the Contract Documents, and in this Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

When a work, term, or phrase is used in this Bond, it shall be interpreted or construed first as defined in this Bond, the Contract, or the Contract Documents; second, if not defined in the Bond, Contract, or Contract Documents, it shall be interpreted or construed as defined in applicable provisions of the Iowa Code; third, if not defined in the Iowa Code, it shall be interpreted or construed according to its generally accepted meaning in the construction industry; and fourth, if it has no generally accepted meaning in the construction industry, it shall be interpreted or construed according to its common or customary usage.

Failure to specify or particularize shall not exclude terms or provisions not mentioned and shall not limit liability hereunder. The Contract and Contract Documents are hereby made a part of this Bond.

Project No. _____

(CON'T – PERFORMANCE, PAYMENT AND MAINTENANCE BOND)

Witness our hands, in triplicate, this _____ day of _____, 20____.

SURETY:

PRINCIPAL:

Surety Company

By: _____
Signature of Attorney-in-Fact/Officer

Name of Attorney-in-Fact/Officer

Company Name

Company Address

City, State, Zip Code

Company Telephone Number

Company E-Mail

Bidder

By: _____
Signature

Name (Print/Type)

Title

Address

City, State, Zip Code

Telephone Number

E-Mail

NOTE:

1. All signatures on this Performance, Maintenance & Payment Bond must be original signatures in ink; electronic, copies, or facsimile of any signature will not be accepted.
2. This Bond must be sealed with the Surety's raised, embossing seal or official adhesive seal.
3. The Certificate or Power of Attorney accompanying this Bond must be valid on its face and sealed with the Surety's raised, embossing seal or official adhesive seal.
4. The name and signature of the Surety's Attorney-in-Fact/Officer entered on this Bond must be exactly as listed on the Certificate or Power of Attorney accompanying this Bond.

SECTION 00800 - SPECIAL PROVISIONS

FOR

Main Street Reconstruction
City of Marshalltown
Marshalltown, Iowa

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1) CONTRACT PROVISIONS

a) Completion Date

- i) All work under the Contract must be completed as detailed in Section 00500 – Contract.

b) Liquidated Damage

- i) Damages in the amount as detailed in Section 00500 – Contract will be assessed for each calendar or working day the work remains incomplete.

c) Maintenance Bond & Warranty

- i) To remedy any and all defects as detailed in Section 00500 – Contract.

d) Bid Quantity Revisions

- i) All quantities are estimates and subject to revision by the Jurisdiction.
- ii) Quantity changes that do not materially change the character of the work to be performed and amount to less than Twenty (20) percent of a given bid item or less than Five (5) percent of the total contract amount shall not affect the unit price bid.

2) DEFINITION AND INTENT

a) The Specifications that apply to the materials and construction practices for this project are defined as follows:

- i) The 2024 Edition of the SUDAS Standard Specifications, except as modified by these Special Provisions to the Technical Specifications.
- ii) Omissions of words or phrases such as “the Contractor shall”, “in accordance with”, “shall be”, “as noted on the Plans”, “according to the Plans”, “a”, “an”, “the” and “all” are unintentional; supply omitted words or phrases by inference.
- iii) “Final Acceptance” and “Final Completion” shall mean final approval of the project as defined in SUDAS 1090, 1.08, C.
- iv) “Owner”, “Jurisdiction” and “City” shall mean the City of Marshalltown, acting through the Council.
- v) “Person” shall mean any individual, partnership, limited partnership, joint venture, society, association, joint stock company, corporation, limited liability company, estate, receiver, trustee, assignee, or referee, whether appointed by a court or otherwise, and any combination of individuals.
- vi) “Engineer” shall mean the Engineer of Record.
- vii) The intent of the Technical Specifications is to describe the construction desired, performance requirements, and standards of materials and construction.
- viii) “Standard Drawings” shall mean the Figures bound within the SUDAS Standard Specifications and/or the Typical Drawings bound within the Plans.
- ix) “Substantial Completion” shall be as defined by the Iowa Administrative Code Chapter 573.28.
- x) “Work” shall mean the work to be done and the equipment, supplies, and materials to be furnished under the Contract unless some other meaning is indicated by the context.
- xi) “Or equal” shall follow manufacturers names used to establish standards and, if not stated, is implied.

b) Engineer: Bolton & Menk, Inc., 1519 Baltimore Drive, Ames, Iowa 50010.

3) GENERAL PROVISIONS AND COVENANTS

a) Division 1 of the General Provisions and Covenants of the 2024 Edition SUDAS Standard Specifications is modified as follows:

- i) Section 1020.1.09B, Unit Price Attachment.

- (a) A computer-generated unit price attachment may be submitted by the Bidder as specified by this Section.
 - ii) Section 1050, 1.05 - Shop Drawings, Certificates, and Equipment Lists
 - (a) Electronic submittal of shop drawings will be allowed.
 - (b) If hardcopy submittals are used, the Contractor shall submit a minimum of three (3) copies plus any additional required by the Contractor.
 - iii) Section 1050, 1.15 – Additional Contractor Responsibilities
 - (a) No Changes.
 - iv) Section 1070, 3.06 -Endorsement Naming Jurisdiction As An Additional Insured / Cancellation And Material Change / Governmental Immunities Endorsement
 - (b) – Bolton & Menk shall be named as additional insured
Marshalltown Chamber of Commerce shall be named as additional insured for 225 E. Main street for the use of their parking lot for construction staging/storage.
- 4) WORK REQUIRED
- a) Work under this Contract includes all materials, equipment, transportation, traffic control, and associated work for the construction of the Main Street Reconstruction as described in the Official Publication.
- 5) PLANS AND SPECIFICATIONS
- a) The Jurisdiction will furnish five (5) sets of plans and specifications to the Contractor after award of the Contract. The Contractor shall compensate the Jurisdiction for printing costs for additional copies required.
 - b) Contractor shall provide one set of plans and specifications for each foreman and superintendent in charge of each crew on the job.
- 6) SUBMITTALS
- a) Contractor shall provide a construction schedule showing dates of starting and completing various portions of work. Schedule shall be updated as needed or as requested by Engineer due to changes in progress of construction from original schedule. Updates shall be completed within one week of request.
 - b) Contractor shall submit the following information for Engineer's review. Three (3) copies plus any additional copies required by Contractor shall be submitted to the Engineer at the preconstruction conference or at least 14 days prior to utilization of the particular item on this project.
 - i) Testing reports.
 - ii) Manufacturer's data for materials that are to be permanently incorporated into the project.
 - iii) Details of proposed methods of any special construction required.
 - iv) Purchase orders and subcontracts without prices.
 - v) Traffic control and staging plan.
 - vi) Such other information as the Engineer may request to ensure compliance with contract documents.
 - vii) List of Subcontractors and Suppliers.
- 7) STANDARDS AND CODES
- a) Construct improvements with best present day construction practices and equipment.
 - b) Conform with and test in accordance with applicable sections of the following standards and codes.
 - i) American Association of State Highway and Transportation Officials (AASHTO).

- ii) American Society for Testing and Materials (ASTM).
- iii) Iowa Department of Transportation Standard Specifications (Iowa DOT).
- iv) American National Standards Institute (ANSI).
- v) American Water Works Association (AWWA).
- vi) American Welding Society (AWS).
- vii) Federal Specifications (FS).
- viii) Iowa Occupational Safety and Health Act of 1972 (IOSHA).
- ix) Manual of Accident Prevention in Construction by Associated General Contractors of America, Inc. (AGC).
- x) Standards and Codes of the State of Iowa and the ordinances of the Jurisdiction.
- xi) Other standards and codes which may be applicable to acceptable standards of the industry for equipment, materials and installation under the Contract.

8) EMPLOYMENT PRACTICES

- a) Neither the Contractor nor the Contractor's subcontractors shall employ any person whose physical or mental condition is such that their employment will endanger the health and safety of anyone employed on the Project.
- b) The Contractor shall not commit any of the following employment practices and agrees to include the following clauses in any subcontracts:
 - i) To discharge from employment or refuse to hire any individual because of sex, race, color, religion, national origin, sexual orientation, marital status, age, or disability unless such disability is related to job performance of such person or employee.
 - ii) To discriminate against any individual in terms, conditions, or privileges or employment because of sex, race, color, religion, national origin, sexual orientation, marital status, age, or disability unless such disability is related to job performance of such person or employee.

9) RESPONSIBILITY OF CONTRACTOR

- a) Contractor shall provide supervision of the work.
- b) Contractor shall provide protection of all property from injury or loss resulting from construction operations.
- c) Contractor shall replace or repair objects sustaining any such damage, injury, or loss, to the satisfaction of the Jurisdiction and Engineer.
- d) Contractor shall cooperate with Jurisdiction, Engineer, and representatives of utilities in locating underground utility lines and structures. Incorrect, inaccurate, or inadequate information concerning location of utilities or structures shall not relieve the Contractor of responsibility for damage thereto caused by construction operations.
- e) Contractor shall keep cleanup current with construction operations.
- f) Contractor shall comply with all Federal, State of Iowa, and local laws and ordinances.

10) WORK HOURS/COMMUNITY EVENTS

- a) The Contractor will be required to limit work hours on the Project from 7:00 a.m. to 7:00 p.m., Monday through Saturday, unless otherwise directed by the Engineer.
- b) The following Community Events are scheduled. Contractor is required to coordinate with the Jurisdiction as needed to allow use of public property as necessary for the event(s). If Contract continues for multiple years, event is still in force even though dates and locations may change.
 - i) October Fest
 - ii) Holiday Stroll

iii) Bee Ridiculous Day

11) CONSTRUCTION FACILITIES

- a) Contractor shall provide telephone numbers where Contractor's representative can be reached during work days and on nights and weekends in event of emergency.
- b) Contractor shall provide and maintain suitable sanitary facilities for construction personnel for duration of work; remove upon completion of work.
- c) Contractor shall not store construction equipment, employee vehicles, or materials on streets open to traffic.
- d) Contractor shall provide suitable storage facilities necessary for proper storage of materials and equipment. Location for storage of equipment by Contractor is subject to approval of the Engineer.
- e) Contractor will be required to make arrangements for all services required during the construction period and pay for such services at no additional cost to the Jurisdiction.

12) PROJECT SUPERVISION

- a) The Contractor shall be represented in person at the construction site at all times that construction operations are proceeding. Representation constitutes a qualified superintendent or other designated, qualified representative capable of providing adequate supervision. The representative must be duly authorized to receive and execute instructions, notices, and written orders from the Engineer.
- b) Resolution of issues that arise during construction relating to traffic control, construction staging, etc. is the responsibility of the Contractor.
- c) Weekly progress meetings, if specified at the preconstruction conference, may be held at the project site to review project schedules, coordinate activities, resolve conflicts, and coordinate the construction work. The day and time for this meeting will be set at the preconstruction conference. The Contractor shall provide qualified representation at each meeting.
- d) Refer to Division 1 – General Provisions and Covenants, Section 1080 – Contractual Provisions, Part 1 – Prosecution and Progress of the Work, Section 1.10 Contractors Employees, Methods and Equipment for additional requirements.
- e) Contractor shall provide supervision of all sub-contractors and their personnel while on the site.

13) COORDINATION WITH OTHERS

- a) Contractor shall cooperate and coordinate construction with the Jurisdiction, utility companies, affected property owners, and other contractors working in the vicinity of this project.
- b) It is the Contractor's responsibility to schedule and coordinate work to minimize construction delays and conflicts.
- c) Contractor shall cooperate and coordinate with property owners prior to beginning work that will affect their parcel.

14) CONSTRUCTION GENERAL

- a) Procedures outlined herein are not intended to fully cover all special construction procedures but are offered as an aid to the Contractor in planning work.
- b) Contractor shall cooperate with the City of Marshalltown, Iowa and the Engineer to minimize inconvenience to property owners, other jurisdictions and motorists and to prevent delays in construction and interruption to continuous operation of utility services and site access.
- c) The Contractor is expected to provide adequate personnel and equipment to perform work within the specified time of construction.
- d) Contractor shall install and maintain orange safety fence around all open trenches or open structures when left unattended.
- e) Contractor shall complete surface restoration and cleanup activities as construction progresses.

15) CONSTRUCTION LIMITS

- a) Contractor shall confine the construction operations within the construction limits shown on the plans.
- b) Contractor shall not store equipment, vehicles, or materials within the right-of-way of any streets open to traffic or on temporary access roads at any time.
- c) Areas disturbed outside of construction limits shall be restored at the contractor's expense to the satisfaction of the Jurisdiction.
- d) Contractor shall protect trees, fences and landscaping within the construction limits not marked for removal.
- e) All work on this project will be within City and County Right-of-Way, Easements or Public Property.

16) CONSTRUCTION SCHEDULE

- a) The Contractor will prepare and submit to the Engineer a project schedule that will assure the completion of the project within the time specified within the Contract.
- b) Adequate equipment and forces shall be made available by the Contractor to start work immediately upon receipt of the Notice to Proceed.
- c) Contractor shall submit a construction schedule at the preconstruction conference.
- d) Contractor shall periodically update the construction schedule as needed due to changes in progress of construction from the original schedule or as requested by the Engineer. Updates shall be completed within one week of request.
- e) The Contractor shall be required to meet the final completion date as specified in Section 00500 – Contract.
- f) Contractor shall notify the Jurisdiction and property owners at least 48 hours prior to any street closures.
 - i) Notification shall be provided by written notice placed on the front door. The following items shall be included within the notice:
 - (a) The street name, location and proposed date of street closure.
 - (b) The estimated schedule for completion of work.
 - (c) The estimated date for reopening of the street.
 - (d) Procedure for garbage collection recycling and postal service.

17) CONSTRUCTION PHASING

- a) Contractor shall refer to construction staging and traffic control plans when included in construction plans.
- b) Contractor shall include construction phasing on the required construction schedule submittal.

18) CONSTRUCTION SURVEY DOCUMENTATION & RESPONSIBILITIES OF ENGINEER AND CONTRACTOR

- a) The Contractor shall maintain at the construction site one complete set of drawings suitably marked to show all deviations from the original set of drawings and other information as specified. Supplementary sketches shall be included, if necessary, to clearly indicate all work as constructed.
- b) All manholes and valves shall be located with tie-off dimensions to known items on the plans or in the field to enable the Contractor or City personnel to locate these structures for adjustment.
- c) Tie-ins with existing pavements and utilities shall be verified for correctness of alignment and elevation prior to construction staking. Any discrepancies discovered during this verification process will be brought to the attention of the Engineer for review and assistance with resolution prior to staking.
- d) When survey work is done under traffic conditions, the traffic control shall be in place prior to commencement of survey work.

19) MATERIALS TESTS

- a) Testing shall follow the requirements of the SUDAS Standards Specifications. Contractor specified testing shall be completed by an independent testing laboratory retained by the Contractor and approved by the Engineer. Contractor shall provide all necessary testing.
- b) The Contractor shall coordinate all material testing with the Engineer.
- c) The Contractor shall not deliver materials to the project site until laboratory tests and/or certifications have been furnished which verify compliance of materials with specifications.
- d) Contractor shall provide gradation and materials certifications for all granular materials. Certify that sources of Portland Cement and aggregate sources are Iowa DOT approved.

20) SOIL BORINGS

- a) See Attached

21) EXISTING UTILITIES

- a) Location of utility lines, mains, cables and appurtenances shown on plans are from information provided by utility companies and records of the Jurisdiction.
- b) Prior to construction, Contractor shall contact all utility companies and have all utility lines and services located. The Contractor is responsible for excavating and exposing underground utilities in order to confirm their locations ahead of the work.
- c) The Contractor is solely responsible for damage to utilities or private or public property due to utility disruption.
- d) The Contractor shall notify utility company immediately if utility infrastructure is damaged during construction.
- e) The Contractor shall support and protect all utilities that are not moved.
- f) Utility services are not generally shown on plans; protect and maintain services during construction. Notify Jurisdiction and affected property Jurisdictions 48 hours prior to any planned utility service interruptions.
- g) If private utility work occurs within/adjacent to the site during the construction period, Contractor shall coordinate work schedules with the Engineer.
- h) Existing utilities shall remain in substantially continuous operation during construction. Contractor shall select the order and methods of construction that will not interfere with the operation of the utility systems. Interrupt utility services only with approval of Jurisdiction and Engineer.
- i) No claims for additional compensation or time extensions will be allowed to the Contractor for interference or delay caused by utility companies.

22) SALVAGE OF MATERIALS / DISPOSAL

- a) The Contractor shall remove from the project site and dispose of trees, shrubs, vegetation, excess soil excavation, rubbish, concrete, granular materials and other materials encountered as shown on plans and as specified. Excess soil excavation not designated for waste locations shall be disposed of as directed by the Engineer.
- b) The City of Marshalltown, Iowa retains first right of refusal for retaining any existing materials removed by the construction.
- c) The Contractor shall dispose of materials in accordance with applicable laws and ordinances. Disposal sites are subject to the review and approval of the Engineer.
- d) Burning of brush and other debris is not permitted. Contractor is responsible for selecting disposal location off site.
- e) The Contractor shall dispose of broken concrete, asphalt, granular material, rubble and excess or unsuitable excavated material. Contractor is responsible for selecting disposal location off site.
- f) The Contractor shall cooperate with all applicable City, State and Federal agencies concerning disposal of materials.

- g) The Contractor shall carefully remove, in a manner to prevent damage, all materials and equipment specified or indicated as salvage. The Contractor shall protect and store items specified.
- h) Any items damaged in removal, storage or handling through carelessness or improper procedures shall be replaced by the Contractor in kind with new items.

23) TRAFFIC CONTROL

- a) The Contractor shall provide sufficient surveillance of the traffic control devices to ensure compliance during the entire construction period. The Contractor shall furnish names, addresses, and phone numbers of at least two (2) local individuals capable of immediate response who will be responsible for the site security and traffic control devices to:
 - i) The Engineer;
 - ii) The Jurisdiction; and
 - iii) Local Law Enforcement Agencies.
- b) The Contractor shall schedule the work to cooperate fully with business property owners and occupants abutting the project to minimize the time of restricted access to their property during the construction period.
- c) The Contractor shall notify the City and property owners at least 48 hours prior to any street closures.
 - i) Notification shall be provided by written notice delivered to the business. The following items shall be included within the notice:
 - (1) The street name, location and proposed date of street closure;
 - (2) The estimated schedule for completion of work;
 - (3) The estimated date for reopening of the street; and
 - (4) Procedure for garbage collection/recycling and postal service.
 - ii) Contractor shall accommodate and maintain safe access to homes for property owners. Access to homes shall be considered incidental to the project.
- d) The cost of maintaining vehicular and pedestrian traffic on temporary surfaced drives and walkways, including the eventual removal of the temporary surfacing material, shall be considered incidental to traffic control.
- e) In the event that any of the above right-of-way require traffic to be detoured around the construction zone, the Contractor shall prepare the detour route with the appropriate Agency representatives. The Contractor shall provide and maintain all signing and other traffic control required. The affected Agency shall be notified by the Contractor before re-routing traffic. Dust control and road maintenance of the by-pass route shall be the Contractor's responsibility.
- f) Contractor shall furnish, erect and maintain traffic control devices as specified in the construction drawings and directed by the Engineer including signs, barrels, cones and barricades to direct traffic and separate traffic from work areas. Traffic control shall be in place prior to the closing of any streets.
- g) Contractor shall provide traffic control devices in accordance with the Iowa DOT Standard Specification, Section 2528, Traffic Control, and the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).
- h) Adjustments to the traffic control or the addition of flaggers will be required if, in the opinion of the Engineer, undue traffic congestion occurs.
- i) Contractor shall provide continuous access for police, fire and other emergency vehicles.
- j) Contractor shall notify the Engineer in writing at least 72 hours prior to the start of any construction operation that will necessitate land closure or internal traffic control signing.

24) TEMPORARY FENCES

- a) Contractor shall install temporary fencing around open excavations or material storage areas and as directed by Engineer to prevent access of unauthorized persons to construction areas.
- b) Contractor shall provide orange plastic mesh safety fence with a nominal height of 48". Support fence securely on driven posts in vertical position without sagging.
 - i) Refer to Iowa DOT Section 4188.03 for fence materials.
- c) Temporary fencing installed around open excavations or material storage areas is incidental to construction and will not be measured for payment.
- d) Contractor shall remove temporary fencing upon completion of construction.

25) EROSION CONTROL (NPDES Permit)

- a) If Contractor fails to install and/or perform the appropriate erosion and sediment control practices, as determined by the Engineer, the Engineer may issue a written order to the Contractor. Failure to perform this work within 72 hours of notification of non-compliance may result in the Jurisdiction or Engineer arranging for completion of the work by others. A contract deduction may be made equal to the total of all costs to perform such work so arranged, including but not limited to, labor, materials, equipment and administrative costs.
- b) It shall be the Contractor's responsibility to update the Erosion Control Plan during construction and have the plan available on site at all times.
- c) Contractor is responsible for preparing the SWPPP to match staging, phasing and construction methods as work progresses. Contractor shall comply with the erosion control requirements of said plan, the Iowa Code and local ordinances. Protect against erosion and dust pollution on this project site and any off-site deposit or borrow area used for this project.
- d) The Contractor will publish the necessary notification for the NPDES permit prior to the start of construction. The Contractor shall obtain an NPDES permit from the Iowa DNR for the area within the limits of this project based on the Pollution Prevention Plan. It shall be the Contractor's responsibility to update the plan during construction and have the plan available on site at all times.
- e) The Contractor shall protect adjoining property (including public sanitary/storm sewer systems and streets) from any damage resulting from movement of earth or other debris from the project site. Any damage shall be repaired immediately.
- f) Contractor shall prevent the accumulation of earth or debris on adjoining public or private property. Contractor shall remove any accumulation of earth or debris immediately and prevent the repetition of any instance where earth or debris moves from the project site to adjoining public or private property.
- g) Contractor shall provide erosion control measures necessary to protect against siltation and erosion from the flow of storm water. Maintain continuous operation of the storm sewer system throughout the construction period.
- h) Contractor shall use silt fence and similar Best Management Practices (BMP) at all drainage courses, swales and storm sewer system inlets/outlets to protect against siltation and erosion as shown in the construction drawings or as directed by the Engineer.
- i) Erosion protection measures, other than those specified as unit price pay items, are incidental.
- j) The Contractor will be fully liable for all damages to public and private property caused by their action or inaction in providing for handling of storm water flow during construction.
- k) As construction progresses, stabilization is required in those segments of the corridor that become available to do so. The Contractor shall not wait until all grading and paving operations are completed before commencing final surface restoration.
- l) The Contractor shall anticipate multiple mobilizations to complete finish grading operations in surface restoration areas.

26) DEWATERING

- a) Contractor shall perform all construction work in dry conditions.
- b) Unless specified in the Bid Items, all costs associated with dewatering activities shall be incidental to the project.
- c) Contractor shall submit dewatering methods to the Engineer for review. Obtain the Engineer's approval on methods prior to construction.
- d) Groundwater levels are subject to variation. No additional compensation will be permitted due to high groundwater conditions.
- e) Should cohesive soils with no wet sand seams or layers be encountered, it may be possible to control water seepage by draining groundwater to temporary construction sumps and pumping it outside the perimeter of the excavation.
- f) The Contractor shall not pump water from open excavation in sand and gravel below the natural ground water level.
- g) Contractor shall maintain water levels 2 feet or more below the bottom of excavations in saturated cohesionless (sand and/or gravel) soils to prevent upward seepage, which could reduce subgrade support.
 - i) A dewatering system (well points or shallow wells) shall be installed when working in cohesionless soils.
 - ii) Costs of installing and operating dewatering system are incidental, unless specified otherwise.
- h) Contractor shall provide means for conveying surface water encountered during construction.
 - i) Surface water shall be prevented from flowing into excavation and accumulated water shall be removed.
 - ii) Surface water and storm sewer flows shall be diverted around areas of construction.
 - iii) Sanitary sewers shall not be used for the disposal of dewatering or trench water.
- i) Contractor shall backfill pipe and structures prior to stopping dewatering operations. Contractor shall not lay pipe or construct concrete structures on excessively wet soils.
- j) Costs of conveying both surface water and groundwater are incidental.

27) READY MIX CONCRETE USED ON PAVING PROJECTS

- a) Contractor will be required to provide plant/truck batch tickets as detailed in the Iowa DOT Construction Manual, Chapter 9, Section 9.03.
- b) Contractor shall be required to provide a batch ticket for each delivered load to the Engineer or their field staff at the time of delivery on site.

28) INCIDENTAL CONTRACT ITEMS

- a) The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid in the absence of a specific bid item for the work. These costs shall be included in the Unit Price Bid for the individual items associated with the stated specific item or work effort. Such items of work include, but are not limited to:

- Concrete header removal
- Connections to existing storm sewer structures and pipes unless specified for separate payment
- Construction and removal of temporary access roads
- Construction fencing
- Construction staging and phasing
- Coordination and cooperation with affected property owners
- Coordination and cooperation with the City of Marshalltown
- Coordination and cooperation with other contractors
- Coordination and cooperation with other projects in the area
- Coordination and cooperation with utility companies
- Dewatering and handling storm water flow during construction

Dust control measures
Engineering fabric
Excavation, verification and protection of existing utilities
Field and wood fence removal
Field testing
Finish grading
Full depth saw-cutting of existing pavement
Grading for storm sewer outlets
Granular backfill and bedding for storm and sanitary sewer installation
Granular surfacing removal
Maintenance and watering for seeding and sodding
Maintenance of erosion control measures, including silt removal
Material testing
Monitoring weather conditions
Mowing
Overhaul
Pipe and structure bedding material
Porous backfill for subdrain
Proof rolling
Protection of existing hydrant(s) and valve(s)
Protection of existing trees and plantings not shown as removals
Protection of existing utilities and light poles
Removing and reinstalling existing signs
Reseeding
Site cleanup/restoration
Temporary safety closures
Temporary sheeting and shoring
Water valve removal
Working backfill to reduce moisture content
Working subgrade to achieve acceptable moisture content
Wrapping of storm sewer pipe joints

******END OF SECTION******

SECTION 00900 - NOTICE OF AWARD

(To be executed after bid is awarded.)

TO: Contractor _____
Address 1 _____
Address 2 _____
City, State, Zip _____

PROJECT TITLE: Main Street Reconstruction

PROJECT DESCRIPTION: Reconstruction of Main Street from Center Street east to 3rd Avenue and reconstruction of Center Street from State Street to Church Street.

OWNER'S NAME: City of Marshalltown

The OWNER has considered the BID submitted by you for the above-described WORK in response to its Notice to Bidders dated _____, 20____, and Instructions to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$_____.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER within fifteen (15) days of this, the ____ day of _____, 20____.

You must deliver to the OWNER Three (3) fully executed counterparts of the Contract, including all the Contract Documents. Each of the Contract Documents must bear your signature. You must deliver with the executed Contract acceptable Contract Security (Bonds), Certificate(s) of Insurance, and other required information. Within ten days after you comply with the above conditions, the OWNER will return to you one fully executed counterparts of the Contract.

Dated this, the ____ day of _____, 20____.

City of Marshalltown
Marshalltown, Iowa

BY: _____

TITLE: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____,
this, the ____ day of _____, 20____.

BY: _____

TITLE: _____

SECTION 00910 - NOTICE TO PROCEED

(To be executed after Agreement, Bonds and Insurance Certificates are approved.)

TO: Contractor	Date:
Address 1	Project Title: Main Street Reconstruction
Address 2	Project Owner: City of Marshalltown
City, State, Zip	Project Location: Marshalltown, Iowa

You are hereby notified to commence WORK in accordance with the Contract awarded on _____, 20____.
The Contract Time shall commence to run on Anticipated start date: _____, 20____. WORK shall proceed in accordance with the dates set forth in the Contract and all other provisions of the Contract Documents.

City of Marshalltown
Marshalltown, Iowa

BY: _____
TITLE: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____,
this, the ____ day of _____, 20____.

BY: _____
TITLE: _____

TO BE PRINTED ON CONTRACTOR'S LETTERHEAD

LETTER OF TRANSMITTAL

Contractor Name _____

Contractor Address _____

Contractor City, State, Zip _____

Contractor Phone/E-Mail _____

DATE:	BMI # 0A1.129221
ATTENTION: Gregory A. Broussard	
RE: Main Street Reconstruction	
SUBMITTAL NO.:	

WE ARE SENDING YOU

- ☐ Attached ☐ Under Separate Cover via _____ the Following Items:
- ☐ Shop Drawings ☐ Prints ☐ Specifications ☐ Copy of Letter
- ☐ _____

No. Copies Submitted	Specification Section	Subject of Shop Drawing or Other Submittal
Review Action: <i>(To be filled in by Engineer)</i>	☐ No Exceptions Taken ☐ Make Corrections Noted	☐ Amend - Resubmit ☐ Rejected - Resubmit ☐ Not Reviewed ☐ For Record

Comments: *(To be filled in by Engineer.)*

- ☐ The CONTRACTOR hereby notifies the OWNER that this Shop Drawing is in conformance with SUDAS Specifications Section 1050, 1.05 referenced in the Contract Documents.
- ☐ The CONTRACTOR hereby notifies the OWNER that this Shop Drawing is not in conformance with Section 1050, 1.05 of the SUDAS Specifications referenced in the Contract Documents and nevertheless asks approval thereof. The features not in conformance are as follows:

1. _____
2. _____
3. _____
4. _____
5. _____

CONTRACTOR SIGNED: _____

DATE: _____

(To be filled in by Engineer)

COPY TO:

ENGINEER SIGNED:

DATE: _____

Distribution: ☐ Contractor ☐ Owner ☐ Project Engineer ☐ Field Office ☐ Other

TECHNICAL SPECIFICATIONS

FOR

MAIN STREET RECONSTRUCTION

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

SUPPLEMENTAL SPECIFICATIONS

FOR

MAIN STREET RECONSTRUCTION

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

APPENDIX
FOR
MAIN STREET RECONSTRUCTION
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

SECTION 03 11 00 - CONCRETE FORMWORK

PART 1 -- GENERAL

1.1 THE REQUIREMENTS

- A. All formwork shall comply with all the recommendations of ACI 347 "Recommended Practice for Concrete Formwork" except as modified herein.
- B. The CONTRACTOR shall assume full responsibility for the design and construction of all formwork.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards

- ACI 117 Specifications for Tolerances for Concrete Construction and Materials.
- ACI 301 Specifications for Structural Concrete for Buildings.
- ACI 347 Recommended Practice for Concrete Formwork.

1.3 QUALITY ASSURANCE

- A. The CONTRACTOR shall set and maintain concrete forms and perform finishing operations so as to ensure that the completed work conforms to the shape, line, grade, and dimensions as shown in the drawings. Formwork tolerances shall not exceed permissible deviations given in ACI 117. Use Class A formwork facing material offset. Use "very flat floor" finishing tolerance. See Section 03 30 00, 1.5 D. for additional construction tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown. Surface defects and irregularities are defined as finishes and are to be distinguished from tolerances.

PART 2 -- PRODUCTS

2.1 MATERIALS

- A. For all concrete surfaces to be unexposed, form surfaces that will be in contact with concrete shall be of No. 2 common or better lumber or other material producing equivalent finish.
- B. For all concrete surfaces to be exposed, finishes shall be as specified in Section 03 30 00 "Finish for Concrete Walls".
- C. Form ties shall be factory-fabricated, snap-off metal ties of design that will not allow form deflection and will not spall concrete upon removal. Wire ties will not be permitted. Ties shall be free of devices that will leave a hole larger than 1 inch or less than 1/2-inch in diameter in the concrete surface. The portion of the tie remaining in the concrete after removal of the exterior parts shall not project beyond the surface of the concrete and shall be at least 1-1/2 inches back from any surface of the concrete that will be exposed, painted, damp-proofed, waterproofed, or receive direct applications of plaster.
- D. Forms for exposed or painted surfaces shall be coated with a form release agent before reinforcement is placed. The form release agent shall be a commercial formulation of satisfactory and proven performance that will not bond with, stain, or adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces. The release agent shall be used as recommended in the manufacturer's printed or written instructions. Forms for unexposed surfaces, other than retained in-place metal forms, may be wet with water in lieu of coating immediately before placing

concrete, except that in cold weather with probable freezing temperatures, coating shall be mandatory. Surplus debonding agents on form surfaces, reinforcing steel, and construction joints shall be removed before the concrete is placed.

- E. Prior to coating with the above-specified release agent, wood forms shall be sealed with a penetrating type wood sealer. The sealer shall be applied in strict accordance with the manufacturer's recommendations.

2.2 DESIGN

- A. Formwork must be designed, constructed, supported, braced, and maintained so that it will safely support all dead and live loads to which it may be subjected. Formwork shall be sufficiently tight to prevent leakage of mortar so that finished concrete will conform to shapes, lines, grades, and dimensions indicated in the drawings.
- B. The weight of the formwork, freshly placed concrete, workmen and equipment, rate of placement and temperature, tamping, and vibration of the concrete shall all be considered in the design of the formwork. Forms and falsework to support roof and floor slabs shall be designed for a loading of at least that required by ACI 347.

PART 3 -- EXECUTION

3.1 CONSTRUCTION

- A. **Formwork** - Forms shall be designed, constructed, and maintained to ensure that after the removal of forms, the finished concrete members will have true surfaces free of deformities or bulges, conforming accurately to the indicated shapes, dimensions, lines, elevations, and positions. Recommendations given in ACI 347 shall be followed. Form surfaces that will be in contact with concrete shall be thoroughly cleaned before each use.

3.2 FORM TIES

- A. **Embedded Ties:** Wire ties for holding forms will not be permitted. No form-tying device or part thereof, other than metal, shall be left embedded in the concrete. Ties shall not be removed in such a manner as to leave a hole extending through the interior of the concrete members. The use of snap ties that cause spalling of the concrete upon form stripping or tie removal will not be permitted. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in order to prevent the loss of cement paste. Where metal rods extending through the concrete are used to support or strengthen forms, the rods shall remain embedded and shall terminate not less than 1-1/2 inches back from the formed face or faces of the concrete.
- B. **Removable Ties:** Where taper ties are approved for use, after the taper tie is removed, the hole shall be thoroughly cleaned and roughened for bonding. A precast neoprene or polyurethane tapered plug shall be located at the wall centerline. The hole shall be completely filled with non-shrink or regular cement grout. Exposed faces of walls shall have at least the outer 2 inches of the exposed face filled with cement grout which shall match the color and texture of the surrounding wall surface. The CONTRACTOR shall be responsible for water-tightness and any repairs needed.

3.3 FORM REMOVAL

- A. Forms shall be removed in a manner that ensures the complete safety of the structure. Where the structure as a whole is supported on shores, forms for beam and girder sides, columns, and similar vertical structural members may be removed after 48 hours, provided the concrete is sufficiently hard not to be injured thereby. Supporting forms or shoring shall not be removed until structural

members have acquired sufficient strength to support safely their own weight and any construction and/or storage load to which they may be subjected, but in no case shall they be removed in less than 7 days, nor shall forms used for curing be removed before the expiration of curing period. Care shall be taken to avoid spalling the concrete surface or damaging concrete edges. Wood forms shall be completely removed.

- B. Supporting forms or shoring shall not be removed until the strength of control test specimens has attained a value of at least 3,000 psi for column and 3,000 psi for all other work. Test specimens required for control tests to determine form removal time shall be provided in numbers as directed and shall be in addition to those otherwise required for concrete control. Test specimens shall be removed from molds after 24 hours and stored adjacent to that portion of the structure which they represent and shall receive, insofar as practicable, the same protection from the elements during curing as is given those portions of the structure which they represent and shall not be removed from the structure for transmittal to the laboratory prior to the expiration of three-fourths of the proposed period before removal of the forms. Care shall be exercised to ensure that the newly unsupported portions of the structure are not subjected to heavy construction or material loading.
- C. Forms for all parts of the work not specifically mentioned herein shall remain in place for periods of time as determined by the ENGINEER.
- D. Recommendations for shoring given in ACI 347 shall be followed for all re-shoring.

**** END OF SECTION ****

SECTION 03 20 00 - CONCRETE REINFORCEMENT

PART 1 -- GENERAL

1.1 THE REQUIREMENTS

- A. CONTRACTOR shall include all the necessary ties, chairs, and accessories required for support and spacing of the reinforced steel, all mesh columns, and end reinforcing as detailed.
- B. All concrete and steel have been designed to conform with ACI 318, and details on all steel shall conform therewith and with Chapter 5 of ACI 301.
- C. Fabrication tolerances, placement, detailing, and estimating practice shall be in accordance with the "Manual of Standard Practice", latest edition of the CRSI, and as covered in Chapter 8, "Placing Reinforcing Bars".

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 33 00 - Submittals

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Commercial Standards
 - ACI 301 Specifications for Structural Concrete
 - ACI 315R Guide to Presenting Reinforcing Steel Design Details
 - ACI 318 Building Code Requirements for Structural Concrete
 - A1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - ASTM A615 Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - AWS D1.4 Structural Welding Code – Steel Reinforcing Bars

1.4 SUBMITTALS

- A. CONTRACTOR shall submit shop drawings to the ENGINEER in accordance with Section 01 33 00 for approval prior to fabrication. Sizes, dimensions for fabrication and diagram for placement of bars, and type and location of all accessories shall be indicated. No fabrication shall proceed on any section until approved drawings are received on such section.

PART 2 -- PRODUCTS

2.1 MATERIALS

- A. Epoxy Coated Deformed Billet steel bars shall conform to ASTM A615, Grade 60, as shown in engineering notes on the structural detail plans. Epoxy coating shall conform to ASTM A775
- B. Welded steel wire shall conform to ASTM A1064. Wire size and location are shown on the plans.
- C. Chairs for slabs exposed to view shall be plastic-coated steel, or approved equal, to prevent rust stains on the exposed concrete.

2.2 SPACERS

- A. Provide spacers with tie wire at proper intervals to hold slab bars in position and to raise them above forms to distances shown. Support reinforcing on bolsters or chairs and carrying bars whether or not specifically called for in drawings. Provide wire bar type supports complying with ACI 315R, unless otherwise indicated. Do not use wood, brick, and other unacceptable materials.

PART 3 -- EXECUTION

3.1 FABRICATION

- A. Reinforcing bars shall be bent cold, in the shop, with proper equipment for making cold bends. Field bending of reinforcement will not be allowed.

3.2 CLEANING AND STORAGE

- A. Reinforcement upon delivery and before installation shall be cleaned and free of rust, scale, dirt, grease, oil, snow, ice, etc.
- B. Reinforcement shall be protected from rusting in storage. Steel having deposits of scale will be rejected.

3.3 PLACEMENT

- A. Reinforcement shall be placed accurately according to the plans and secured in position by approved accessories. The minimum clear distance between parallel bars shall not be less than 1-1/2 times the normal size of the coarse aggregate and shall be as required by ACI 318.
- B. No splices of reinforcement shall be made except as shown on the plans or as specified or authorized by the ENGINEER. Reinforcing shall be kept in the proper position during concrete placement.

3.4 REINFORCEMENT COVER

- A. The reinforcement shall be protected by the thickness of concrete indicated on the plans. Where not shown otherwise, concrete coverage over the reinforcement shall be as follows:

Location of Reinforcement	Cover
Surfaces where concrete is deposited directly against the ground (footings)	3" Clear bottom and sides
Formed surfaces exposed to the ground, water, or weathering (walls)	2" - Both faces
Beams, girders, and columns	1-1/2" - Clear to ties or stirrups
Joists, slabs	1" Bottom and top

- B. Exposed reinforcing bars intended for bonding with future extensions shall be protected from corrosion by concrete or other adequate approved coverings, or as shown in the drawings.

**** END OF SECTION ****

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 -- GENERAL

1.1 THE REQUIREMENTS

- A. Concrete has been designed to conform with ACI 318 (latest edition). Concrete construction shall also conform to ACI 301 and ACI 350. Except where this SECTION is variance therewith, such publications are hereby made a part of this specification.
- B. Except as mentioned in Paragraph 1.2, this section shall include (but is not limited to) the following:
 - 1. Footings and foundation walls of all descriptions.
 - 2. Bases, pads, and footings for equipment.
 - 3. Concrete accessories and building in cast-in-place items furnished under other sections.
 - 4. All design mixes and tests.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 45 00 Testing and Inspection
- B. Section 03 11 00 Concrete Formwork
- C. Section 16110 Electrical Conduit and Fittings

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Commercial Standards
 - ACI 211.1 Recommended Practice for Selecting Proportions
 - ACI 212.2R Guide for Use of Admixtures in Concrete
 - ACI 214 Recommended Practice for Evaluation of Strength Test Results of Concrete
 - ACI 301 Specifications for Structural Concrete
 - ACI 304 Recommended Practice for Measuring, Mixing, and Placing Concrete
 - ACI 305.1 Specification for Hot Weather Concreting
 - ACI 306.1 Standard Specification for Cold Weather Concreting
 - ACI 308 Recommended Practice for Curing Concrete
 - ACI 315R Guide to Presenting Reinforcing Steel Design Details
 - ACI 318 Building Code Requirements for Structural Concrete
 - ACI 347 Recommended Practice for Concrete Formwork
 - ACI 350R Concrete in Sanitary Engineering Structures
 - ASTM C31 Methods for Making and Curing Concrete Test Specimens in the Field
 - ASTM C33 Specification for Concrete Aggregate
 - ASTM C39 Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - ASTM C94 Specification for Ready-Mixed Concrete
 - ASTM C143 Test Method for Slump of Portland Cement Concrete
 - ASTM C150 Specification for Portland Cement

ASTM C192	Methods for Making and Curing Concrete Test Specimens in the Laboratory
ASTM C260	Specifications for Air-Entraining Admixtures for Concrete
ASTM C494	Specifications for Chemical Admixtures for Concrete
ASTM C618	Specification for Fly Ash
ASTM C989	Specification for Slag Cement

1.4 SUBMITTALS

- A. All submittals shall be in accordance with Section 01 33 00 "Submittals" and shall be made for products specified in this section.
- B. **Mix Design:** The CONTRACTOR shall submit a design mix at least 3 weeks prior to scheduled concrete placement for each type and strength of concrete used for compliance with the specifications.
- C. **Admixture:** When a water-reducing admixture is to be used, the CONTRACTOR shall furnish mix designs for concrete with admixture.
- D. **Shrinkage Test Results:** Refer to Part 2.2.B of this Section.
- E. **Independent Testing Laboratory Review:** An Independent Testing Laboratory that is familiar with local aggregates, cement, fly ash, and admixtures shall design or complete a design review and provide a recommendation of Mix Designs No. 1 and 2. Any changes to Mix Designs No.1 and 2 after review and approval shall require an additional review and approval. The review shall include the following items at a minimum:
 - 1. Review the Akali Silica Reactivity (ASR) potential of proposed aggregates. Independent Lab shall state no reasonable potential for ASR or complete ASR testing per ASTM 1260.
 - 2. Review the deleterious materials content of the proposed aggregate.
 - 3. Review the mix design, cement, aggregate, and shrinkage test results to meet shrinkage requirements.
 - 4. Review the concrete mix designs to meet strength requirements.
 - 5. Review the compatibility of proposed admixtures.
- F. **Certified Delivery Tickets:** Where ready-mix concrete is used, the CONTRACTOR shall provide delivery tickets at the time of delivery of each load of concrete. Each certificate shall show the total quantities by weight of cement, sand, each class of aggregate, admixtures, and the total gallons of water in the load. Each certificate shall, in addition, state the mix number, total yield in cubic yards, and the time of the day when the batch was dispatched. Quantity of water to be added at the site and still not exceed the water-cement ratio of the mix.

1.5 QUALITY ASSURANCE

- A. Tests on component materials and for compressive strength of concrete will be performed as specified herein. Concrete density by ASTM C138, air content by ASTM C231/C173, and concrete temperature by ASTM C1064 as per ACI 301.

B. Slump

1. Slump test will be done in accordance with ASTM C143.
 - (a) The concrete shall be designed for as low a slump as is practical to fill the form, embed the reinforcing steel, and be free of voids or honeycomb. Use a lower range for machine vibration. The slump shall be as specified in paragraph 2.2C.
2. Slump shall be measured for each mixed batch of concrete or each load delivered to the site.

C. Compression Tests

1. ENGINEER will take one (1) set of concrete cylinders for each day's pour of 25 cubic yards or less, plus one set for each additional 50 cubic yards poured on that day. Cylinders shall be of representative concrete, taken from mixer discharge at the actual time of pouring. OWNER will pay all costs of preparing, transporting to a laboratory, and making of tests. All such tests shall be made at an independent testing laboratory approved by the ENGINEER. The CONTRACTOR shall assist the ENGINEER in making the test cylinders.
2. Each set shall consist of 3 cylinders for 28-day strength testing and additional cylinders if 7-day and 10-day strengths are required. Per ACI two cylinders are to be tested at 28 days, and the average of the two is to be used for determining conformance. The hold cylinder (3rd cylinder) will be tested if the 28-day value is less than the specified strength.
3. Remaining test requirement shall follow ACI 318, except that if the average strength of any set of job-cured cylinders falls below the required strength, the cost of any additional cement necessary to correct subsequent mixes shall be borne by the CONTRACTOR. Also, if the strength is found deficient, the cost of hardened concrete or load tests shall be borne by the CONTRACTOR. The ENGINEER reserves the right to reject any portions of such questionable areas if, in his opinion, the tests indicate that such areas will not safely carry the design loads.
4. All concrete that fails to meet these specifications is subject to removal and replacement at the cost of the CONTRACTOR.

D. Construction Tolerances

1. Finish concrete shall meet the following tolerances:
 - (a) Variations from plumb: $\pm 1/4$ -inch per 10 feet but not more than 1-inch maximum for the entire length
 - (b) Variations from level or indicated grade: $\pm 1/4$ -inch per 10 feet but not more than 1/2-inch for the entire length
 - (c) Variations from horizontal: $\pm 1/4$ -inch per 10 feet but not more than 1/2-inch total variation
 - (d) Variations in size and locations of openings or sleeves: ... $\pm 1/4$ -inch
 - (e) Reinforcing steel placement: ACI 318, Section 7.5.2

Where tolerances are not stated in the specifications, permissible deviations will be in accordance with ACI 347.

E. Leakage Testing

1. Water retaining concrete tanks shall be leak tested as specified in Section 01 45 00 "Testing and Inspections".

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. CONTRACTOR shall be responsible for the delivery, storage, and handling of products.
- B. Products that are discovered to be unsuitable for the intended use shall be removed promptly from the job site.

1.7 JOB CONDITIONS

- A. Methods outlined in ACI 306.1, Standard Specification for Cold Weather Concreting, shall be followed if the concrete is to be placed when the ambient temperature is expected to be less than 40°F.
- B. Methods outlined in ACI 305.1, Specification for Hot Weather Concreting, shall be followed if the concrete is to be placed when the ambient temperature is expected to exceed 90°F.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. Cement

1. The Portland cement to be used shall meet the conditions of ASTM Specification C595 for Type 1L-MS. All cement shall be from the same manufacturer and from the same plant. High early-strength cement may be used only upon the Engineer's approval.
2. Testing compliance for the moderate sulfate (MS) designation shall be by ASTM Method C452.
3. The C₃A content of the Portland cement shall be less than 8 percent in all concrete. Where aggregates are alkali reactive, a cement containing less than 0.60 percent alkalis shall be used. If the Contractor wishes to use Cement with higher C₃A content and fly ash or slag cement to reduce ASR and increase the sulfate resistance, then the contractor, prior to bid, shall submit a detailed proposed mix design with expected shrinkage at 28 days, and the compressive strength at 7, 15 and 28 and 42 days. The use of the proposed mix design shall be approved at least seven (7) days prior to the bid.
4. Concrete forms shall not be removed before the concrete reaches 3000 psi strength. The use of high cement content to reach high early strength would increase the drying shrinkage of the concrete mix.
5. The cement content of the mix shall be adjusted to limit the drying shrinkage to 0.04% at 28 days of air drying. The test beam shall be water cured for 7 days and then air-dried (Modified ASTM C157). Shrinkage Reducing Admixtures to meet this requirement shall be provided at no additional cost to the OWNER. Concrete mix with higher 28-day strength and poor workability but passing the shrinkage requirements would not be accepted. The contractor will be responsible for delivering a concrete mix that could be finished as intended.
6. If Fly Ash is approved, it shall meet the requirements of ASTM C618, Class F. If slag cement is approved, it shall meet the requirements of ASTM C 989. If Fly Ash or Slag cement is approved for providing sulfate resistance, then the maximum water-cement ratio is reduced to 0.42, and the minimum compressive strength of Mixes 1, 2 & 3 in Paragraph 2.2 below is increased to 4500 psi as specified by ACI 350 for moderate sulfate exposure. If fly ash is used, it shall not exceed 15% of total cementitious material by weight. If slag cement conforming to ASTM C 989 is used, it shall not exceed 30% of total cementitious material by weight. The total of fly ash and other pozzolans and slag cement shall not exceed 40% of the total cementitious material by weight.
7. Class C fly ash shall not be used in Mix Designs No. 1 or 2 under any circumstances.

B. Aggregate

1. All fine and coarse aggregate shall be natural sands and gravels or crushed stone that is washed, cleaned, and conforming to ASTM C33 and shall be free of shale, chert, coal, iron oxide, and other deleterious materials. The shale content of the aggregate shall not exceed 0.1 percent. If the shale content is higher than the value specified, then if the Engineer approves the use of such aggregates for the shrinkage tests, the contractors submit shrinkage test results based on aggregate with comparable shale content to get such aggregates approved. Without shrinkage tests, aggregates with higher shale content will not be approved.
2. The maximum size of coarse aggregate shall not be larger than one-fifth of the narrowest dimension between forms of the member for which the concrete is to be used, nor larger than three-fourths of the minimum clear spacing between reinforcing bars. The coarse aggregate shall conform to Table II of ASTM Specification C33. Use 1-1/2-inch aggregate for structures requiring low shrinkage in lieu of 3/4" aggregate (use Mix No. 1 instead of Mix No. 2.).
3. Fine Aggregate: Shall Conform to ASTM C33.

C. Water

1. Water shall be potable, clean, and free from strong acids, alkalis, oils, or organic materials and meet ASTM C1602, "Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete".

D. Admixtures (Air-entrained Concrete)

1. Admixtures for air-entrained concrete shall be used for sidewalks and all concrete exposed to the weather and water/wastewater retaining structures.
2. Water Reducing Admixtures shall meet the requirements of ASTM C494, Type A, and shall not contain any chloride ions except a trace amount.
3. Water Reducing and Retarding Admixtures shall meet the requirements of ASTM C494, Type D, and shall not contain any chloride ions except a trace amount.
4. High-Range Water-Reducing Admixture (Super Plasticizer) shall meet the requirements of ASTM C494, Type F or G, and shall not contain any chloride ions except a trace amount.
5. Air-entraining admixtures shall meet the requirements of ASTM C260.
6. The content of air-entrained concrete shall be 5 to 6 percent for concrete with 3/4" maximum size aggregate and 4 1/2 to 5 1/2 percent for concrete with 1-1/2" maximum size aggregate.
7. Manufacturer or Equal:
 - (a) Darex or Daravair Series, by GCP Applied Technologies (W. R. Grace & Co.)
 - (b) Toch Toxement AEA
 - (c) Sika AEA
 - (d) Protex

E. Chemical Admixture

1. The use of chemical admixture shall be in accordance with ACI 212.2R and shall be approved by the ENGINEER.
2. The admixture shall meet the requirements of ASTM C494 as specified above.
3. No chlorides shall be used.

4. Shrinkage Reducing Admixture (SRA)

(a) The concrete shall be in compliance with the modified version of ASTM C157-17 where the maximum drying shrinkage shall not exceed 0.040% in 28 days following a 7-day submersion period (see table following section 2.2c herein for applicability).

(b) Manufacturer:

(1) Eclipse 4500, by GCP Applied Technologies (W. R. Grace & Co.) or equal.

F. Non-Shrink Grout

1. All grout shall be non-metallic and non-gaseous, which can be poured, pumped, or damp-packed. The grout shall be suitable for both interior and exterior applications. It shall be non-shrink when tested in accordance with ASTM C1107 at a fluid consistency of 20-30 seconds.

2. The grout shall be a one-step product delivered to the job site in bags containing a premixed formulation requiring only the addition of water prior to use.

3. Precision non-shrink grout shall be used on all pumps, blowers, and equipment bases.

4. Manufacturer or Equal:

(a) General Purpose: (attain 7000 psi strength in 28 days)

(1) Masterflow 713

(2) Duragrout - L & M 14K

(3) Five Star Grout

(b) Pump Bases, Equipment Pads: (shall attain 9000 psi strength in 28 days)

(1) Masterflow 928

(2) Crystex - L & M

(3) Five Star Grout

G. Concrete Grout

1. Concrete grout shall be proportional with cement, fine and coarse aggregates, water, water reducer, and air-entraining agent to produce a mix having an average strength of 3000 psi at 28 days. The slump should not exceed 5 inches and should be low as practical and yet retain sufficient workability.

H. Cement Grout

1. Cement grout shall be a mixture of one-part Portland cement to 1 or 2 parts sand with sufficient water to place the grout. The water content shall not allow the grout to flow.

I. Curing Materials

1. Chemical curing compound: Blend of sodium, meta, and potassium silicates that effectively cure the concrete, leaving surfaces residual and membrane-free, ready to receive subsequent toppings, coatings, or penetrating treatments. "L&M Cure" as manufactured by L&M Construction Chemicals, Inc. or equal.

2. Burlap with Polythene backing sheets shall conform to ASTM C171 Class 3 and shall consist of burlap weighing not less than 10 oz/lin. yard, 40 inches wide, impregnated on one side of white opaque polyethylene 6 mils thick.

3. Membrane-Forming Curing Compound shall be liquid type conforming to ASTM C 309, Type 1, clear, Type 1D with fugitive dye for interior work, and Type 2, white, pigmented for exterior work.

J. Vapor Barrier: Shall meet the requirements of ASTM D4397 and shall be at least 10 mils thick.

2.2 CONCRETE STRENGTH

- A. Mixes shall be designed to secure concrete having the compressive strength required by the drawings or stated in these specifications. The water/cement ratio shall be consistent with the concrete strength requirements. Surface water contained in the aggregate shall be included as part of the mixing water. Consistency shall be designed for good workability and plasticity for proper placing.
- B. The recommended cement content shall be adjusted to meet the maximum dry shrinkage of 0.04% at 28 days (ASTM C157). Shrinkage reducing admixture (SRA) shall be provided at no additional cost to the OWNER. The CONTRACTOR shall furnish the Independent Laboratory testing of Dry Shrinkage and Compressive Strength on mix designs with cement and aggregates from the same sources as evidence of the amount of dry shrinkage of the mix. If previous laboratory tests are not available on the mix designs proposed, then the Contractor shall hire an independent laboratory to conduct dry shrinkage and compressive tests, and the results shall be submitted with the mix design for approval by the ENGINEER. If trial mixes are used, make a set of at least 6 cylinders for compressive strength in accordance with ASTM C192 and 6 test specimens for shrinkage tests in accordance with ASTM C157. Test 3 cylinders for compressive strength and 3 test specimens for shrinkage at 7 days and three at 28 days. After approval of mixes, no substitution in material or changes in proportion will be allowed without additional testing. The water-to-cement ratio used for shrinkage testing shall not exceed the value listed in Paragraph C below. If the water-to-cement ratio for shrinkage testing is less than the value listed in Paragraph C, the shrinkage test water-to-cement ratio shall be the maximum value and replace the value listed in Paragraph C.
- C. Concrete of the various mixes indicated and as required in all sections of these specifications or drawings shall be proportioned and mixed for the following requirements:

Mix Number	1	2		
Minimum Compressive Strength at 28 Days	4000	4000		
Recommended Minimum Cementitious Material Content*	As required by Design	As required by Design		
Maximum Water-Cement Ratio	0.45	0.45		
Maximum Shrinkage at 28 days (%) (ASTM C157)	0.04	0.04		
Portion of Structure	Alternate to Mix 2 for Slabs in contact w/water or fill	Footings, and piers in contact w/water, fill, or Slabs		
Size of Coarse Aggregate	1-1/2"	3/4"		
Slump Maximum	+/- 2" of Design Recommendations	+/- 2" of Design Recommendations		
Air Content†	6%± 1.5%	6% ± 1.5%		

* Note: Cement content shall be adjusted to meet the minimum compressive strength specified.

† Air shall be eliminated from the mix for slabs on grade and building interior slabs not subject to freeze and thaw cycles.

2.3 READY-MIXED CONCRETE

- A. At the CONTRACTOR'S option, ready-mixed concrete may be used to meet the requirements as to materials, batching, mixing, transporting, and placing as specified herein and in accordance with ASTM C94.
- B. Ready-mixed concrete shall not be allowed to stand in the truck more than one hour before placing in forms, including time in route.
- C. Each batch of ready-mixed concrete delivered to the job site shall be accompanied by a certified weighmaster delivery ticket furnished to the ENGINEER in accordance with Paragraph 1.4 C, specified herein.
- D. Water shall not be added at the job site unless authorized by the ENGINEER.

PART 3 -- EXECUTION

3.1 SUBGRADE PREPARATION

- A. Subgrade shall be free from standing water, mud, and debris at the time of placing concrete.
- B. The earth's surface shall be firm and damp.
- C. When concrete is to be placed on highly pervious materials, which might allow flowing groundwater to damage fresh concrete, the contact surface shall be covered with a layer of asphalt-impregnated building paper or polyvinyl chloride sheeting prior to placement of the concrete.

3.2 PROPORTIONING AND MIXING

- A. Proportioning of concrete mix shall conform to the requirements of Chapter 3 of ACI 301.
- B. Mixing of concrete shall conform to the requirements of Chapter 7 of ACI 301.
- C. **Slump:** Maximum slump shall be as specified in Paragraph 2.2C.
- D. **Retempering:** Retempering of concrete or mortar which has partially hardened will not be permitted.

3.3 PLACING REINFORCEMENT

- A. Steel shall be placed according to Section 03 20 00 and according to Section 5.5 of ACI 301, whichever is more rigid.
- B. Immediately after delivery, reinforcing shall be sorted for size, shape, and length or by final usage. Store on racks clear of the ground and protect at all times from the weather.
- C. The CONTRACTOR shall cooperate with the ENGINEER to permit inspection of reinforcement before concrete is placed. The CONTRACTOR shall notify the ENGINEER 24 hours in advance of any concrete pour.
- D. Inspection by the ENGINEER does not relieve the CONTRACTOR of his responsibility to comply with the drawings and specifications. Pouring of the concrete signifies that the CONTRACTOR is satisfied with the placing of reinforcement, levels, and lines of forms, placement of sleeves and forms for holes, locations of accessories, etc.

3.4 CONSTRUCTION JOINTS

- A. Construction joints shall be made only at points shown in the drawings or approved by the ENGINEER. All such joints shall be keyed with reinforcement as shown; joining faces shall be thoroughly cleaned, wetted, and slushed with neat Portland Cement paste immediately before the next pour.

3.5 EXPANSION JOINTS

- A. Expansion joint material shall be flush with the finished floor elevation. Where floors are painted to be painted, the expansion joint material shall be covered with caulk.

3.6 PLACING OF CONCRETE

- A. Placing of concrete shall conform to Chapter 8 of ACI 301.
- B. Plant-mixed concrete shall not be allowed to stand in the truck more than one hour before placing in forms, including time in route.
- C. Preparation:
 - 1. Remove hardened concrete, wood chips, shavings, and other debris from forms.
 - 2. Remove hardened concrete and foreign materials from the interior surfaces of mixing and conveying equipment.
 - 3. Have forms and reinforcement inspected and approved by the resident Engineer before depositing concrete.
 - 4. Provide runways for wheeling equipment to convey concrete to the point of deposit. Keep equipment on runways that are not supported by or bear on reinforcement. Provide similar runways for protection of vapor barrier on coarse fill.
- D. Bonding: Before depositing new concrete on or against concrete that has been set, thoroughly roughen and clean existing surfaces of laitance, foreign matter, and loose particles.
 - 1. Preparing surface for applied topping:
 - (a) Remove laitance, mortar, oil, grease, paint, or other foreign material by sandblasting. Clean with vacuum-type equipment to remove sand and other loose material.
 - (b) Broom clean and keep the base slab wet for at least four hours before the topping is applied.
 - (c) Use a thin coat of one-part Portland cement, 1.5 parts fine sand, bonding admixture, and water at a 50:50 ratio and mix to achieve the consistency of thick paint. Apply to a damp base slab by scrubbing with a stiff fiber brush. New concrete shall be placed while the bonding grout is still tacky.
- E. Placing: For special requirements, see paragraphs HOT WEATHER and COLD WEATHER.
 - 1. Do not place concrete when weather conditions prevent proper placement and consolidation, when concrete has attained its initial set, or has contained its water or cement content for more than 1 1/2 hours.
 - 2. Deposit concrete in forms as near as practicable in its final position. Prevent splashing of forms or reinforcement with concrete in advance of placing concrete.
 - 3. Do not drop concrete freely more than 10 feet for concrete containing the high-range water-reducing admixture (superplasticizer) or 5 feet for conventional concrete. Where greater drops

are required, use a tremie or flexible spout (canvas elephant trunk) attached to a suitable hopper.

4. Discharge contents of tremies or flexible spouts in horizontal layers not exceeding 20 inches in thickness and space tremies such as to provide a minimum of lateral movement of concrete.
5. Continuously place concrete until an entire unit between construction joints is placed. The rate and method of placing concrete shall be such that no concrete between construction joints will be deposited upon or against partly set concrete after its initial set has taken place or after 45 minutes of elapsed time during concrete placement.
6. On the bottom of members with severe congestion of reinforcement, deposit a 1-inch layer of flowing concrete containing the specified high-range water-reducing admixture (superplasticizer). Successive concrete lifts may be a continuation of this concrete or concrete with a conventional slump.

3.7 COLD-WEATHER REQUIREMENTS

- A. Curing of concrete shall conform to Chapter 12 of ACI 301 and to these specifications.
- B. Concrete must be kept wet for at least five days. Any concrete subject to rapid drying from wind or sun shall be protected by canvas, straw, polyethylene, curing compound, or other approved methods for this period.
- C. Floors or walks shall not be used for any purpose until curing is complete. The floor, when used, shall be kept clean of nails, sand, and all abrasive materials.
- D. For cold weather work, the CONTRACTOR shall also follow recommendations ACI 306.1, The CONTRACTOR shall be familiar with these procedures and shall provide protection as outlined in ACI 306.1. From October 15 to April 15, the concrete shall be delivered to the site at a temperature not less than 60°F. The CONTRACTOR may request a variance on a daily basis if the expected low temperature for the day is to be above 32°F.
- E. The CONTRACTOR shall maintain a daily log outlining the cold weather concreting protection methods used. A signed copy of these logs shall be submitted to the ENGINEER weekly. The log shall be a thorough, dated, daily diary giving clear reference to the structure, location, and quantity of each concrete pour. At a minimum, the following information, as outlined in ACI 306.1, shall be included in the diary:
 1. Date, time, and quantity of pour.
 2. Daily outside high temperature.
 3. Daily outside low temperature.
 4. Basic daily weather conditions, including wind conditions, cloud conditions, and precipitation.
 5. Concrete temperature in the truck at the time of delivery.
 6. Concrete temperature ranges throughout the entire pour at the end of the pour for on-grade placements with a sketch and the temperature of the concrete at the end of the pour for walls and columns.
 7. Protection methods being utilized.
 8. Period of protection and temperatures of the concrete at 12-hour intervals during this protection period
 9. If shelters are utilized, interior air temperatures of the shelter at 12-hour intervals.

10. Precautions utilized to prevent the drying and carbonation of the concrete protected by shelters.
 11. Relative humidity inside the shelters.
 12. Method of gradual cooling of the concrete at the end of the protection period.
 13. Preparation and protection of the subgrade, forms, reinforcing steel, etc., prior to placement of the concrete.
- F. Ready-mix suppliers log outlining the methods of heating the materials used in the concrete mixture for each pour.
- G. All admixtures used for cold weather concreting shall be submitted with the design mix data for approval. No calcium chloride accelerators will be allowed in the concrete.

3.8 HOT WEATHER PLACEMENT

- A. Concrete temperature prior to placement shall not exceed 90° F.
- B. Concrete shall not be placed when either the ambient temperature or concrete temperature exceeds 90°F unless the following precautions are taken:
1. Dampen subgrade, forms, and reinforcement prior to placement.
 2. Dampen aggregates slightly if they are dry and absorptive.
 3. Supply a concrete mix with set retarders meeting ASTM C 494 to ensure the concrete remains plastic until the completion of finishing operations.
 4. Concrete shall not be retempered.
 5. Minimize the total time between the commencement of concrete placement and the start of the curing process.
 6. Apply white pigmented curing compound (ASTM C 309, Type 2) at the coverage rate recommended by the manufacturer.
 7. Moist cure when curing compound has not been applied within 2 hours of concrete delivery or as soon after final finishing as practical.
 8. Commence curing after the final steel troweling or when the surface is uniformly hardened past the "thumbprint hard" stage, with no free water at the surface.
- C. Under no circumstances shall concrete be placed when either the ambient air temperature or concrete temperature reaches 95°F.
- D. Concrete materials shall be kept as cool as possible by shading or evaporative cooling. To lower the temperature of the concrete mix, equal volumes of ice may be used to substitute for portions of the mixing water.

3.9 REMOVAL OF FORMS

- A. Forms shall be removed without damaging the concrete. No loading will be permitted on green concrete. Members which must support their own weight shall not have their forms removed until they have attained at least 75 percent of their 28-day strength of the concrete specified. Forms for all vertical walls and columns shall remain in place at least 48 hours after the concrete has been placed. Forms for all the work not specifically mentioned herein shall remain in place for periods of time as determined by the Engineer.

- B. After removal of forms, concrete shall be cured as specified in Paragraph 3.15

3.10 CONCRETE FINISH

- A. Steel trowel finishing shall be done in such a manner as to produce a dense, smooth, impervious surface, free of blemishes, waves, dips, humps, pockets, cat-faces, or trowel marks. Care shall be taken that no excess water is present when the finish is started. Troweling shall be delayed until the water sheen produced by floating is disappearing. Apply a curing compound immediately after troweling unless the concrete is being cured by wet curing, then cure as per the burlap manufacturer's recommendations

3.11 FLOAT FINISH

- A. A float finish shall be given to slab surfaces that receive trowel finish and other finishes as specified and to slab surfaces that are to be covered with membrane waterproofing, membrane roofing, or terrazzo.
- B. After placing is completed, concrete shall not be worked further until ready for floating. Floating shall begin when the water has disappeared, when the concrete mix has stiffened sufficiently to permit proper operation of a power-driven float, or when both conditions have occurred. Any surface water remaining shall be removed before floating. The surface shall then be consolidated with power-driven floats. Hand floating shall be used in locations inaccessible to power-driven floats. The trueness of the surface shall be checked at this stage with a 10-foot 3000-millimeter straightedge.
- C. Surface shall be plane to a tolerance not exceeding 1/4 inch in 10 when tested with a 10-foot straightedge placed on the surface at not less than two different angles. High spots shall be cut down, and low spots shall be filled. Surfaces shall be uniformly sloped to drains. Immediately after completion of leveling, the surface shall be refloated to a uniform, smooth, granular texture.

3.12 TROWEL FINISH

- A. Finish shall be given to slab surfaces that are to be exposed to view and to slab surfaces to be covered with resilient flooring, paint, or other finish coating system. After completion of the float finish as specified above, the surface shall receive a trowel finish. First troweling after completion of float finish shall be done by a power-driven trowel and shall produce a smooth surface that is free of defects but may contain some trowel marks. Additional troweling shall be done by hand after the surface has hardened sufficiently. Final troweling shall be started when a ringing sound is produced as the trowel is moved over the surface. The surface shall be consolidated by hand troweling operation. The finished surface shall be free of trowel marks, uniform in texture and appearance, and plane to a tolerance not exceeding.
- B. 1/4 inch in 10 feet when tested with a 10 feet straightedge placed on the surface in any direction. Surface defects of sufficient magnitude to show through floor covering shall be removed by grinding.

3.13 PATCHING DEFECTIVE CONCRETE WORK FOR CONCRETE PIERS

- A. After removing forms, all concrete surfaces shall be inspected, and any poor joints, voids, stone pockets, all tie holes, and any other defective areas marked by the ENGINEER shall be patched.
- B. Where necessary, defective areas shall be chipped away to a depth of not less than one inch with the edges perpendicular to the surface. The area to be patched and a space at least six inches wide entirely surrounding it shall be wetted to prevent the absorption of water from the patching mortar.

- C. A grout of equal parts Portland cement and sand, with sufficient water to produce a brushing consistency, shall then be well brushed into the surface, followed immediately by the patching mortar.
- D. Patching materials shall be of the same material and of approximately the same proportions used for the concrete, except that the coarse aggregate shall be omitted. The mortar shall not be richer than one-part cement to three parts sand. The amount of mixing water shall be as little as consistent with the requirements of handling and placing. The mortar shall be re-tempered without the addition of water by allowing it to stand for a period of one hour during which time it shall be mixed occasionally with a trowel to prevent setting.
- E. The mortar shall be thoroughly compacted into place and screed off to leave the patch slightly higher than the surrounding surface. It shall then be left undisturbed for a period of one to two hours to permit initial shrinkage before being finally finished.
- F. The patch shall be finished in such a manner as to match the adjoining surface. On exposed surfaces where unlined forms have been used, the final finish shall be obtained by striking off the surface with a straightedge spanning the patch and held parallel to the direction of the form marks.
- G. All patches shall be cured as specified herein.
- H. Tie holes left by the withdrawal of rods or the holes left by the removal of ends of ties shall be filled solid with mortar after first being thoroughly wetted. For holes passing entirely through the wall, a plunger-type grout gun shall be used to force the mortar through the wall, starting at the back face. A piece of burlap or canvas shall be held over the hole on the outside, and when the hole is completely filled, the excess mortar shall be struck off with the cloth flush with the surface. Holes not passing entirely through the wall shall be filled with a small tool that will permit packing the hole solid with mortar. Any excess mortar at the surface of the wall shall be struck off flush with a cloth.
- I. All concrete ridges and protrusions, such as those left by nail holes or insufficient joining of forms, shall be removed by hammering and grinding to the satisfaction of the ENGINEER. No grout wash shall be applied until ridges, protrusions, and other marks left by the forms have been removed to the satisfaction of the ENGINEER.

3.14 FINISH FOR CONCRETE PIERS

- A. All concrete surfaces to receive paint or exposed above grade shall receive a grout finish. The CONTRACTOR shall verify with the painter if Grout Finish is an acceptable surface preparation method. Cleaning operations shall not be undertaken until all contiguous surfaces to be cleaned are completed and accessible. Grout shall consist of one-part Portland cement and 1-1/2 parts fine sand with sufficient water to produce a mixture having the consistency of thick paint. White Portland Cement shall be substituted for a part of gray Portland cement to produce a color matching color of surrounding concrete as determined by a trial patch. The surface of the concrete shall be wetted sufficiently to prevent the absorption of water from the grout. Grout shall be uniformly applied with brushes or a spray gun. Immediately after applying grout, the surface shall be scrubbed vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes. While grout is still plastic, all excess grout shall be removed by working surface with a rubber float, sack, or other means. After the surface whitens from drying (about thirty minutes at normal temperatures), it shall be rubbed vigorously with clean burlap. The surface shall be kept damp for at least 36 hours after the final rubbing.
- B. Tie holes left by the withdrawal of rods or the holes left by the removal of ends of ties shall be filled solid with mortar after first being thoroughly wetted. For holes passing entirely through the wall, a plunger-type grout gun shall be used to force the mortar through the wall, starting at the back face. A

piece of burlap or canvas shall be held over the hole on the outside and when the hole is completely filled, the excess mortar shall be struck off with the cloth flush with the surface. Holes not passing entirely through the wall shall be filled with a small tool that will permit packing the hole solid with mortar. Any excess mortar at the surface of the wall shall be struck off flush with a cloth.

- C. All concrete ridges and protrusions, such as left by nail holes or insufficient joining of forms, shall be removed by hammering and grinding to the satisfaction of the ENGINEER. No grout wash shall be applied until ridges, protrusions and other marks left by the forms have been removed to the satisfaction of the ENGINEER.

3.15 CONCRETE CURING AND PROTECTION

A. General

1. Freshly placed concrete shall be protected from premature drying and cold or hot temperature and shall be maintained without drying at a relatively constant temperature for the period of time necessary for the hydration of cement and proper hardening of concrete. Initial curing shall start as soon as free water has disappeared from the surface of the concrete after placing and finishing. Concrete shall be kept moist for a minimum of 48 hours. Forms removed within seven (7) days after placement of concrete, the concrete surface shall be cured by one of the curing methods specified in Paragraph 3.15B below.
2. Final curing shall immediately follow initial curing and before the concrete has dried. Final curing shall continue until a cumulative number of hours or fraction thereof (not necessarily consecutive) during which the temperature of the air in contact with the concrete is above 50 degrees F 10 degrees C has totaled 168 hours. Alternatively, if tests are made of cylinders kept adjacent to the structure and cured by the same methods, final curing may be terminated when the average compressive strength has reached 75 percent of the 28-day design compressive strength. Rapid drying at the end of the final curing period shall be prevented.

B. Curing Methods

1. Curing shall be accomplished by moist curing, moisture-retaining cover curing, membrane curing, and by combinations thereof, as specified.
2. Moist curing: Moisture curing shall be accomplished by any of the following methods:
 - (a) Keeping the surface of concrete wet by covering it with water
 - (b) Continuous water spraying
 - (c) Covering the concrete surface with specified absorptive cover for curing concrete saturated with water and keeping absorptive cover.
 - (d) Wet by water spraying or intermittent hosing. An absorptive cover shall be placed to provide coverage of concrete surfaces and edges with a slight overlap over adjacent absorptive covers.
3. Moisture-cover curing: Moisture-retaining cover curing shall be accomplished by covering.
 - (a) Concrete surfaces with specified moisture-retaining cover for curing concrete. Cover shall be placed directly on concrete in the widest practical width, with sides and ends lapped at least 3 inches. Cover shall be weighted to prevent displacement; tears or holes appearing during the curing period shall be immediately repaired by patching with pressure-sensitive, waterproof tape or other approved methods.

4. Membrane curing:

- (a) Membrane curing shall be accomplished by applying a specified membrane-forming curing compound to damp concrete surfaces as soon as moisture film has disappeared. The curing compound shall be applied uniformly in a two-coat operation by power-spraying equipment using a spray nozzle equipped with a wind guard. The second coat shall be applied in a direction at right angles to the direction of the first coat. Total coverage for two coats shall be not more than 200 square feet per gallon of curing compound. Concrete surfaces which are subjected to heavy rainfall within 3 hours after the curing compound has been applied shall be resprayed by method and at the rate specified. Continuity of coating shall be maintained for the entire curing period, and damage to the coating during this period shall be repaired immediately.
- (b) Membrane-curing compounds shall not be used on surfaces that are to be covered with coating material applied directly to concrete or with a covering material bonded to concrete, such as other concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, painting, and other coatings and finish materials.

5. Curing Formed Surfaces

- (a) If forms are removed within seven (7) days of placement of concrete, then the concrete shall be cured by any of the curing methods specified.
- (b) Curing of formed surfaces, including undersurfaces of girders, beams, supported slabs, and other similar surfaces shall be accomplished by moist curing with forms in place for full curing period (7 days) or until forms are removed. If forms are removed before seven (7) days, final curing of formed surfaces shall be accomplished by any of the curing methods specified above, as applicable.

6. Curing Unformed Surfaces

- (a) Initial curing of unformed surfaces, such as monolithic slabs, floor topping, and other flat surfaces, shall be accomplished by membrane curing. Unless otherwise specified, final curing of unformed surfaces shall be accomplished by any of curing methods specified above, as applicable final curing of concrete surfaces to receive liquid floor hardener or finish flooring shall be accomplished by moisture-retaining cover curing.

**** END OF SECTION ****

04200 - UNIT MASONRY

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Work Included: all masonry work and related items necessary to complete the work indicated on the drawings and described in the Specifications.
- B. Allied Work Specified Elsewhere
 - 1. Deformed Reinforcing Steel Section 03200
 - 2. Cast-In-Place Concrete Section 03300

1.02 QUALITY ASSURANCE

- A. Qualifications of Workmen: Use only skilled masons who are thoroughly experienced with the materials, methods, and design requirements specified for the cutting and placing of masonry units.
- B. Codes and Standards:
 - 1. Any material or operation specified by reference to the published Specifications of a manufacturer, the American Society of Testing and Materials (ASTM), National Concrete Masonry Association (NCMA) or other published standards shall comply with the current Specification or standard listed.
 - 2. Where provisions of pertinent codes and standards conflict with the requirements of these specifications, the more stringent provisions shall govern.

1.03 SUBMITTALS

- A. Shop Drawings
 - 1. Reinforcing steel: See Section 03200, Concrete Reinforcement
 - 2. Special Shapes: Complete scaled drawings showing all pertinent dimensions for each special shape required.
- B. Certification: The masonry unit manufacturer shall submit, prior to delivery of any materials to the job site, a certificate attesting compliance with the Specifications for grade, type and compressive strength for each type of unit furnished.

1.04 PRODUCT HANDLING AND PROTECTION

- A. General: Use all means necessary to protect concrete masonry materials before, during and after installation and to protect the installed work and materials of all other trades.
- B. Storage:
 - 1. Store masonry units off the ground and protect them from stain or other defacement.
 - 2. Store cementitious materials in a dry location, off the ground and under cover.
 - 3. Store sand to preclude contamination by dirt, organic matter or other harmful substance.
 - 4. Protect reinforcement from rust, ice, or other coating that may reduce or destroy the bond.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Units shall conform to the applicable ASTM Specifications with additional requirements as specified.
 - 1. Hollow non-load bearing: ASTM C129
 - 2. Hollow load-bearing: ASTM C90
 - 3. Solid load-bearing: ASTM C145
 - 4. Brick: ASTM C55, Grade A
 - 5. Light weight concrete block shall meet ASTM Specifications for Haydite or equal aggregate.
- B. Grade:
 - 1. Interior Use: Grade B
 - 2. Exterior Use or Below Grade: Grade A
- C. Size: Sizes of concrete block units shall be as shown on the drawings.
- D. Shapes:

1. Use typical shapes such as corners, jambs, lintels, etc. as required. All outside corners and jambs shall be bull nosed.
 2. Lintel block shall be used under ends of all beams and where otherwise required and/or shown on the drawings.
- E. Water Content: At time of setting the average percentage of moisture shall not exceed 40% of the fully saturated content.

2.02 MORTAR

- A. Materials shall conform to the following standards of quality of the American Society for Testing and Materials.
1. Mortar for unit masonry: ASTM C270
 2. Portland Cement: ASTM C150
 3. Air-entraining Portland cement: ASTM C175
 4. Hydrated Lime: ASTM C207, Type S
 5. Hydraulic Hydrated Lime: ASTM C141
 6. Quicklime: ASTM C5
 7. Aggregates: ASTM C144
- B. Mixing and proportions shall be as outlined in ASTM C270 for the types and uses listed below:
1. Exterior loadbearing walls and those exposed to earth or weather: Type M
 2. Exterior non-loading walls: Type M or S
 3. Interior load-bearing walls: Type M, S, or N
 4. Interior non-load-bearing walls: Type M, S, N, or O
 5. Mortar:
 - a. Shall be one (1) part Portland Cement; one (1) part super hydrated lime, six (6) parts sand (1:2:9) also will be acceptable.
 - b. Mortar for block work and brick shall be standard grey color. A light grey is desired.
- C. Water shall be clean and free of deleterious amounts of acids, alkalies or organic materials.
- D. Antifreeze Compounds: No antifreeze liquid, salts or other substances shall be used in the mortar to lower the freezing point.

2.03 GROUT

- A. Unless otherwise noted, all grout shall have an ultimate compressive strength of 3,000 psi at 28 days as outlined in Section 03300.

2.04 REINFORCING

A. Reinforcing shall meet the following requirements:

1. Bars: ASTM A-615, Grade 60
2. Welded Wire Fabric: ASTM A-185
3. Truss Type Wall Tie
 - a. Exterior composite and faced wall shall be tied with Dur-O-Wall truss trirod or approved equal manufactured from #9 gauge wire conforming to ASTM A82 with galvanized cross rods.
 - b. Interior and single wythe walls use Dur-O-Wall truss standard weight galvanized.

2.05 EXPANSION AND CONTROL JOINTS

A. Provide expansion and control joints in exterior and interior walls. Same shall equal the following:

1. On interior walls exposed to rooms each side use rapid control joint #8 wide flange.
2. Material of molded rubber conforming to ASTM D-2000, 2AA-805.

2.06 MASONRY ANCHORAGE & ACCESSORIES

A. All products listed below shall be from a single manufacturer.

Reference Manufacturer:

Hohmann & Barnard, Inc.
30 Parsons Court
Hauppauge, NY 11788
(800) 645-0616

1. EPDM thru wall flashing
2. Stainless steel metal flashing
3. Closed cell neoprene sponge
4. Plastic weep holes
5. Adhesive backed flashing
6. Stainless steel dovetail anchorage system
7. Stainless steel flashing drip plates
8. Rubber control joints
9. Termination bars
10. Mortar net
11. Grout screens
12. All other miscellaneous anchorages

2.07 OTHER MATERIALS

- A. All other materials, not specifically described but required for a complete and proper installation shall be selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspection: Prior to all work in this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Coordination: Carefully coordinate with all other trades to ensure proper and adequate interface of the work of other trades with the work of this section.

3.02 GENERAL

- A. Installation:
 - 1. Lay units plumb and true to line with uniform joints.
 - 2. Exposed units shall be symmetrical about the centerline of walls, piers, etc.
 - 3. Avoid over-plumbing, and pounding corners and jambs after they are set in position. If adjustment is necessary after mortar has started to harden, remove the mortar and replace with fresh mortar.
 - 4. Prevent mortar or grout from staining the face of masonry which will be left exposed or painted, immediately remove any mortar that does contact the face of such masonry.
 - 5. Do not use chipped or broken units; if any such units are discovered in the finished structure, the Engineer may require their removal and replacement, with new units at no additional cost to the Owner.
- B. Filling of Joints:
 - 1. Exterior walls shall have full head and bed joints.
 - 2. Exterior wall shall have all vertical joints completely filled between masonry units, except the cavity in cavity walls, by one of the following:
 - a. By parging the face of backing or back of facing.
 - b. Pouring joint full of grout.
 - c. Shoving.
 - 3. Unless otherwise noted, interior walls may have face-shell mortar bedding.
- B. Tooling: Unless noted otherwise, all joints shall be completely tooled and slightly concave. Sides of C.M.U. block walls that will receive a waterproof membrane should be tooled and finished flush with the C.M.U. block.

- C. Cutting: All cutting required shall be performed with a power-driven saw in such a manner to provide true and even edges.
- E. Wetting Masonry Units:
 - 1. Keep concrete masonry units dry at all times; do not wet them either before or while they are being laid.
 - 2. Clay brick shall be wetted sufficiently to insure its absorption rate does not exceed 0.025 oz./sq. in./min. at the time it is laid. Each unit shall be properly saturated and surface dry when it is laid.
- F. Protection of Work:
 - 1. Keep masonry work dry during erection by covering with a waterproof membrane at the end of each day and during shut down periods when work is halted by inclement weather.
 - 2. Protection membrane shall overhang each side of wall at least 2 feet and shall be securely anchored.
 - 3. Maintain protection membrane on partially completed walls at all times while they are not being worked on and on completed walls until permanent protection is placed.
 - 4. Protect door jambs and corners from construction damage by installing barricades at locations that are particularly vulnerable.

3.03 COLD WEATHER CONSTRUCTION

- A. The contractor shall submit, for approval of the Engineer, the methods he proposes to use for protecting the masonry against low temperatures.
- B. No masonry shall be laid when the air temperature is less than 40 degrees F., or there is danger of the temperature dropping below 40 degrees F, for 72 hours after masonry is constructed without the above approval.

3.04 CONCRETE BLOCK

- A. Standard Block:
 - 1. Sizes of concrete block units shall be as shown on the drawings.
 - 2. Where block is exposed use high quality uniform joints; strike joints with 18" striking tool.
 - 3. Where block is plastered, high quality dense units are required but minor flaws will be allowed.
- B. Lintel Block:
 - 1. Lintel block shall be used as shown on the drawings.

2. Lintel blocks shall be reinforced as shown on the drawings and filled with 3,000 psi concrete. Do not fill lintel block with mortar.
3. Note on drawings, details and lintel schedule, where lintel blocks used in exterior walls require additional lintel block courses, reinforcing and concrete fill.
4. Unless bottom surface of lintel block is exposed, manufacture with bottom knock out panel at location of grouted cores.

3.05 MORTAR

- A. Mixer: Use a mechanical mixer of one sack minimum capacity.
- B. Mixing Time:
 1. Mix mortar at least three minutes after all materials have been added.
 2. Mix only as much mortar as can be used in one hour after water has been first mixed into the batch.
- C. Retempering:
 1. Mortars shall be used and placed in final position within 2.1/2 hours after mixing.
 2. Mortars that have stiffened because of evaporation of water from the mortar shall be retempered by adding water to restore the required consistency.
 3. Do not use mortar after it has begun to set.

3.06 MASONRY WALL REINFORCING

- A. General:
 1. Load bearing stack bond walls shall have Dur-O-Wall placed 16" o.c. in bed joints, except it shall be at 8" o.c. for the top 3 courses.
 2. Non-load bearing walls shall have Dur-O-Wall installed at 16" o.c.
 3. Reinforcement shall be continuous except it shall not pass thru vertical masonry control joints.
 4. Width of joint reinforcement shall be comparable to wall thickness in all cases.
- B. Intersections:
 1. Furnish prefabricated tee sections at all wall intersections.
 2. Furnish prefabricated corner sections at all inside and outside corners.
- C. Openings:

1. Reinforcing shall be installed in the first and second bed joints, 8" apart, immediately above lintels and below sills at openings.
2. Reinforcing in the second bed joint above and below openings shall extend two feet beyond the jamb.

D. Cavity Wall Ties: Ties for cavity wall construction shall be installed as outlined in Section 2410 of the Uniform Building Code.

3.07 GROUTED REINFORCED MASONRY

A. Reinforcing:

1. Install all reinforcing as indicated on the drawings and outlined in these specifications.
2. Furnish and install all required metal accessories to ensure accurate alignment of steel during placement.
3. Fully embed reinforcement in grout not in mortar or mortar joints.

B. Grouting:

1. Perform grouting in strict accordance with the provisions for highlift grouting as outlined in Chapter 24 of the Uniform Building Code.
2. Do not grout until masonry has cured at least 24 hours.
3. Consolidate all grout at the time of pouring by puddling with a mechanical vibrator, completely filling all cells called for.
4. Provide for cleanouts.
5. All CMU block wall hollow cores shall be reinforced as shown on the drawings and filled with 3000 p.s.i. concrete. Do not fill CMU block hollow cores with mortar.

3.08 INSERTS

- A. Masonry contractor shall coordinate his work with other trades.
- B. Masons shall set and bed in all bearing plates, anchors, bolts, etc. and shall build carefully and properly around all beams, columns, etc. to make a complete and substantial job.
- C. Build in and around any and all equipment and inserts that the owner or other contractors have furnished and set in place.

3.09 CONTROL JOINTS

A. General:

1. Provide control joints in walls and partitions where shown and as detailed.

2. Caulking and back-up for joints is specified in Division 7.
3. Control joints, 2.08 in this section.

B. Installation:

1. Install joint strips as walls are being laid.
2. Keep joint gap free from mortar or debris.

3.10 CLEANING

- A. Pointing: Point up open joints or holes in joints, cut out defective joints and repoint.
- B. Cleaning: Thoroughly clean all exposed masonry with brushing and scrubbing to remove all mortar drippings and stains.
- C. Site Cleaning: Upon completion of all work of this section, promptly remove from the job site all mortar droppings, broken units, and debris arising from the work of this section leaving all areas in a neat and orderly condition.

END OF SECTION

SECTION 04 72 00 - CAST STONE

PART 1 -- PART 1 GENERAL

1.1 SECTION INCLUDES - CAST STONE

- A. Scope - All labor, materials and equipment to provide the Cast Stone shown on drawings and as described in this specification.
 - 1. Manufacturer shall comply with all material set forth in this specification.
 - 2. Installing contractor shall unload, store, furnish all anchors if not supplied by manufacturer, set, patch, clean and seal (optional) the Cast Stone as required.

1.2 METHOD OF MEASUREMENT AND PAYMENT

- A. Measurement and compensation for the following items shall be paid according to the referenced specification or as modified below.
 - 1. Measurement and payment for CAST STONE SEATWALL TYPE 'A' will be by the linear foot (LF) of wall installed complete. The following shall be considered incidental to the unit price: footings, modified subbase, testing, furnishing of product samples, procurement and delivery of manufactured cast stone, staging, installation, silicon sealant of joints, repairs and/or replacements of cast stone units necessitated by contractor mishandling and as deemed necessary by the landscape architect, and site cleanup.
 - 2. Measurement and payment for CAST STONE SEATWALL TYPE 'B' will be by the linear foot (LF) of wall installed complete. The following shall be considered incidental to the unit price: linear light strip, circuitry, and conduit as specified in electrical plans and specifications, footings, modified subbase, testing, furnishing of product samples, procurement and delivery of manufactured cast stone, staging, installation, silicon sealant of joints, repairs and/or replacements of cast stone units necessitated by contractor mishandling and as deemed necessary by the landscape architect, and site cleanup.
 - 3. Measurement and payment for GATEWAY MONUMENT ARCH will be lump sum (LS). The following shall be considered incidental to the unit price: concrete footings and core with reinforcing, cast stone veneer and cap, anchoring, grout, metalwork, linear and internal lighting.

1.3 REFERENCES

- A. ACI 318 – Building Code Requirements for Reinforced Concrete.
- B. ASTM A 185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- C. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Reinforced Concrete.
- D. ASTM C 33 – Standard Specification for Concrete Aggregates.
- E. ASTM C 150 - Standard Specification for Portland Cement.
- F. ASTM C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volume Method.
- G. ASTM C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- H. ASTM C 260 - Standard Specification for Air-Entrained Admixtures for Concrete.
- I. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.
- J. ASTM C 426 – Standard Test Method for Linear Shrinkage of Concrete Masonry Units
- K. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.
- L. ASTM C 618 – Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

- M. ASTM C 666 – Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
- N. ASTM C 979 - Standard Specification for Coloring Pigments for Integrally Pigmented Concrete.
- O. ASTM C 989 – Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete.
- P. ASTM C 1194 - Standard Test Method for Compressive Strength of Architectural Cast Stone.
- Q. ASTM C 1195 - Standard Test Method for Absorption of Architectural Cast Stone.
- R. ASTM C 1364 - Standard Specification for Architectural Cast Stone.
- S. ASTM D 2244 – Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

1.4 DEFINITIONS

- A. Cast Stone – a refined architectural concrete building unit manufactured to simulate natural cut stone.

1.5 SUBMITTALS

- A. Contractor to provide color and texture chart for initial color selection.
- B. Samples: Submit (4) 6" x 6" samples of the Cast Stone that represent the specific finish and color proposed to be furnished for the project.
- C. Test results: Submit manufacturers test results of Cast Stone previously made by the manufacturer in the last 90 days, for the following:
 - 1. Compressive Strength
 - 2. Absorption
 - 3. Air Content (wet cast)
- D. Shop Drawings: Prepare Project-specific information, drawn accurately to scale including,
 - 1. Detail drawings of each distinct unit required to assemble cast stone walls.
 - (a) Piece profiles
 - (b) Cross-sections
 - (c) Reinforcement
 - (d) Exposed faces
 - (e) Arrangement of Joints
 - (f) Anchoring methods
 - (g) Anchors
 - (h) Annotation of stone types and their location

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. A current producer member of Cast Stone Institute, with a minimum of 10 years of experience in producing cast stone of types required for project.
 - 2. Manufacturer must follow EPA (Environmental Protection Agency) and DNR (Department of Natural Resources) regulations regarding:
 - (a) Permits
 - (b) Storm water runoff

- (c) Waste water management
 - (d) Air emission control
- 3. Manufacturer shall have sufficient plant facilities to produce the shapes, quantities and size of Cast Stone required in accordance with the project schedule.
- 4. Manufacturer shall submit a written list of projects similar in scope and at least three (3) years of age, architect and contractor references.
- B. Standards:
 - 1. Comply with the requirements of the Cast Stone Institute Technical Manual and the project specifications. Where a conflict may occur, the contract documents shall prevail.

PART 2 -- PART 2 PRODUCTS

2.1 CAST STONE

- A. Manufacturer
 - 1. Edwards Cast Stone
777 Edwards Road
Dubuque, Iowa 52003
563-556-0535
 - 2. Or Approved Equal Manufacturer of Cast Stone
- B. Items:
 - 1. Cast Stone Seatwall Type 'A' and 'B'
 - (a) Sized and installed per plans and details
 - 2. Cast Stone Veneer
 - (a) Smooth veneer to be 3-1/2" thickness
 - (b) Rock face veneer to be 4-1/2" thickness
 - (c) Sized and installed per plans and details
 - 3. Cast Stone Cap
 - (a) Sized and installed per plans and details
- C. Casting method
 - 1. Wet cast
- D. Comply with ASTM C 1364
- E. Physical properties: Provide the following:
 - 1. Compressive Strength - ASTM C 1194: 6,500 psi (45 Map) minimum for products at 28 days.
 - 2. Absorption - ASTM C 1195: 6% maximum by the cold water method, or 10% maximum by the boiling method for products at 28 days.
 - 3. Air Content – ASTM C173 or C 231, for wet cast product shall be 4-8% for units exposed to freeze-thaw environments. Air entrainment is not required for VDT products.
 - 4. Freeze-thaw – ASTM C 1364: The CPWL shall be less than 5% after 300 cycles of freezing and thawing.
 - 5. Linear Shrinkage – ASTM C 426: Shrinkage shall not exceed 0.065%.

- F. Job Site Testing: One (1) sample from production units may be selected at random from the field for each 500 cubic feet delivered to the job site.
 - 1. Three (3) field cut cube specimens for each of the samples shall have an average minimum compressive strength of not less than 85% with no single specimen testing less than 75% of design strength as allowed by ACI 318
 - 2. Three (3) field cut cube specimens from each of these samples shall have an average maximum cold-water absorption of 6%
 - 3. Field specimens shall be tested in accordance with ASTM C 1194 and C1195

2.2 RAW MATERIALS

- A. Portland cement – Type I or Type III, white and/or grey, ASTM C 150.
- B. Coarse aggregates - Granite, quartz or limestone, ASTM C 33, except for gradation, and are optional for the VDT casting method.
- C. Fine aggregates - Manufactured or natural sands, ASTM C 33, except for gradation.
- D. Colors - Inorganic iron oxide pigments, ASTM C 979 except that carbon black pigments shall not be used.
- E. Admixtures- Comply with the following:
 - 1. ASTM C 260 for air-entraining admixtures.
 - 2. ASTM C 494/C 495M Types A - G for water reducing, retarding, accelerating and high range admixtures.
 - 3. Other admixtures: integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.
 - 4. ASTM C 618 mineral admixtures of dark and variable colors shall not be used in surfaces intended to be exposed to view.
 - 5. ASTM C 989 granulated blast furnace slag may be used to improve physical properties. Tests are required to verify these features.
- F. Water – Potable
- G. Reinforcing bars (as required):
 - 1. ASTM A 615/A 615M. Grade 40 or 60 steel galvanized or epoxy coated when cover is less than 1.5 in. (37 mm).
 - 2. Welded Wire Fabric: ASTM A 185 where applicable for wet cast units.
 - 3. All anchors, dowels and other anchoring devices and shims shall be standard building stone anchors commercially available in a non-corrosive material such as zinc plated, galvanized steel, brass, or stainless steel Type 302 or 304.

2.3 COLOR AND FINISH

- A. Color to be selected by the landscape architect from manufacturer's physical samples of manufacturer's standard colors. Contractor to deliver physical samples to the landscape architect for color selection.
- B. All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1/32 in. (0.8 mm) and the density of such voids shall be less than 3 occurrences per any 1 in.2 (25 mm2) and not obvious under direct daylight illumination at a 5 ft (1.5m) distance.
- C. Units shall exhibit a texture equal to the approved sample when viewed under direct daylight illumination at a 10 ft (3 m) distance.

1. ASTM D 2244 permissible variation in color between units of comparable age subjected to similar weathering exposure.
 - (a) Total color difference – not greater than 6 units.
 - (b) Total hue difference – not greater than 2 units.
- D. All Cast Stone shall be hand-sanded and acid washed with a 10% muriatic acid solution.
- E. Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under direct daylight illumination from an 8-ft distance.
- F. The occurrence of crazing or efflorescence shall not constitute a cause for rejection.
- G. Remove cement film, if required, from exposed surfaces prior to packaging for shipment

2.4 REINFORCING

- A. Minimum reinforcing of the cast stone units shall be determined by the manufacturer's structural engineer licensed in the State of Iowa and documented in manufacturer's signed shop drawings. Reinforcing shall account for safe handling and structural stress in addition to final in situ placement of cast stone.
- B. Reinforcement shall be noncorrosive where faces exposed to weather are covered with less than 1.5 in. (38 mm) of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars or as required by the manufacturer.
- C. Welded wire fabric reinforcing shall not be used in dry cast products.

2.5 CURING

- A. Cure units in a warm curing chamber approximately 100°F (37.8°C) at 95 percent relative humidity for approximately 12 hours, or cure in a 95 percent moist environment at a minimum 70°F (21.1°C) for 16 hours after casting. Additional yard curing at 95 percent relative humidity shall be 350 degree-days (i.e. 7 days @ 50°F (10°C) or 5 days @ 70°F (21°C)) prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.

2.6 MANUFACTURING TOLERANCES

- A. Cross section dimensions shall not deviate by more than $\pm 1/8$ in. (3 mm) from approved dimensions.
- B. Length of units shall not deviate by more than length/ 360 or $\pm 1/8$ in. (3 mm), whichever is greater, not to exceed $\pm 1/4$ in. (6 mm).
 1. Maximum length of any unit shall not exceed 12 times the average thickness of such unit unless otherwise agreed by the manufacturer.
- C. Warp, bow or twist of units shall not exceed length/ 360 or $\pm 1/8$ in. (3 mm), whichever is greater.
- D. Location of dowel holes, anchor slots, flashing grooves, false joints and similar features – On formed sides of unit, 1/8 in. (3 mm), on unformed sides of unit, 3/8 in. (9 mm) maximum deviation.

2.7 PRODUCTION QUALITY CONTROL

- A. Testing
 1. Test compressive strength and absorption from specimens selected at random from plant production.
 2. Samples shall be taken and tested from every 500 (14 m³) cubic feet of product produced.
 3. Perform tests in accordance ASTM C 1194 and C 1195.
 4. New and existing mix designs shall be tested for strength, absorption and Freeze Thaw compliance prior to producing units.

2.8 DELIVERY, STORAGE AND HANDLING

A. Piece Marks

1. Clearly label each piece with project name, piece weight and corresponding identifier from shop drawings.

B. Packaging

1. Protect cast stone units from stains or damage during shipping and storage.
2. Provide pallet label consisting of job name, piece identifier and total pallet weight.
3. Provide detailed shipping information consisting of each item per pallet per truck.

PART 3 -- DELIVERY, STORAGE AND HANDLING

3.1 EXAMINATION

- A. Installing contractor shall check Cast Stone materials for fit and finish prior to installation. Do not set unacceptable units.

3.2 SETTING TOLERANCES

- A. Comply with Cast Stone Institute Technical Manual
- B. Set stones 1/8 in. (3 mm) or less, within the plane of adjacent units.
- C. Joints, plus - 1/16 in. (1.5 mm), minus - 1/8 in. (3 mm).

3.3 JOINTING

A. Joint size:

1. At stone/brick joints 3/8 in. (9.5 cm).
2. At stone/stone joints in vertical position 1/4 in. (6 mm) (3/8 in. (9.5 mm) optional).
3. Stone/stone joints exposed on top 3/8 in. (9.5 mm).

B. Joint materials:

1. Mortar, Type N, ASTM C 270.
2. Use a full bed of mortar at all bed joints.
3. Flush vertical joints full with mortar.
4. Leave all joints with exposed tops or under relieving angles open for sealant.
5. Leave head joints in copings and projecting components open for sealant.

C. Location of joints:

1. As shown on shop drawings.
2. At control and expansion joints unless otherwise shown.

3.4 SETTING

- A. Drench units with clean water prior to setting.
- B. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
- C. Set units in full bed of mortar, unless otherwise detailed.
- D. Rake mortar joints 3/4 in. (18 mm) in. for pointing.
- E. Remove excess mortar from unit faces immediately after setting.

F. Tuck point unit joints to a slight concave profile.

3.5 JOINT PROTECTION

A. Prime ends of units, insert properly sized backing rod and install required sealant.

3.6 REPAIR AND CLEANING

A. Repair chips with touchup materials furnished by manufacturer.

B. Saturate units to be cleaned prior to applying an approved masonry cleaner.

C. Consult with manufacturer for appropriate cleaners.

3.7 INSPECTION AND ACCEPTANCE

A. Do not field apply water repellent until repair, cleaning, inspection and acceptance is completed.

*******END OF SECTION*******

SECTION 05 00 00 - STRUCTURAL METAL

PART 1 -- GENERAL

1.1 THE REQUIREMENTS

- A. The requirements of the General Conditions and the Special Provisions shall apply to the work under this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 05 50 00 - Miscellaneous Metal
- B. Section 09 91 00 - Painting

1.3 DEFINITION

- A. **Structural Steel** - Structural steel for this project shall be as defined by the American Institute of Steel Construction in the Code of Practice, most current edition, and shall also include specific items identified in the drawings as "Structural Steel".

1.4 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Specifications:
 - 1. Design, fabrication, and erection of structural steel shall be according to "Specifications for Structural Steel for Buildings" adopted July 7, 2016, and according to the "Code of Standard Practice for Steel Buildings and Bridges" most current edition, all by the American Institute of Steel Construction, 130 East Randolph Street, Suite 2000 Chicago, IL 60601-6204, referred to hereinafter as AISC.
 - 2. Those steel surfaces and connections which will remain exposed and subject to normal view by pedestrians or occupants in the completed structure shall be designed, fabricated, and erected according to the AISC "Specification for Architecturally Exposed Structural Steel", most current edition.
 - 3. The details of all joints, the technique of welding employed, the appearance and quality of welds made, and the methods used in correcting defective work shall conform to the requirements of the AISC Specification listed above and of the "Code of Arc and Gas Welding in Building Construction" of the American Welding Society.
- B. Commercial Standards:
 - ASTM A 36 Specification for structural steel
 - ASTM A 992 Specifications for structural steel
 - ASTM A 325 Specification for high-strength bolts for structural steel joints
 - ANSI/AWS D1.1 Structural Welding Codes - Steel.

1.5 QUALITY ASSURANCE

- A. The shop and field welding of structural joints shall be done by personnel qualified according to the "Standard Qualification Procedure" of the American Welding Society.

1.6 CONTRACTOR SUBMITTALS

- A. Contractor shall electronically submit shop drawings as described in Section 01 33 00 for all structural steel. All fabrication information for components, size and weight of members, type and location of shop and field connections, type, size, and extent of all welds, use welding symbols of the American Welding Society, and welding sequence when required shall be indicated.

PART 2 -- PRODUCTS

2.1 MATERIAL

- A. Structural steel shall conform to ASTM A992 or ASTM A36 as indicated on the structural drawings. The steel shall be new, without rust or scale, and shall be full-length pieces with no built-up lengths, crops, or stubs permitted.
- B. Bolts shall conform to ASTM A325, high-strength bolts, and shall be three-quarters of an inch in diameter unless otherwise indicated.
- C. Filler metal for welding shall be in accordance with the following:
 - 1. Welding electrodes for manual 64T shielded Metal-Arc welding shall conform to ASTM A233 or E70 series.
 - 2. Bar electrodes for granular flux used in the submerged-arc process shall conform to Paragraph 1.17.3 of AISC Specifications for Structural Steel for Building.
- D. Non-metallic, non-shrink grout shall be Master Flow 713 by Master Builders Company, or equal.

2.2 FABRICATION

- A. Workmanship shall conform to best practice and be accomplished by skilled mechanics trained in their trade.
- B. Steel members shall be punched and drilled for attachment of wood nailer and/or other materials as required by project conditions. Slotted holes shall be provided for steel requiring true alignment and for members which cross-building expansion joints.
- C. Shop connections may be welded, riveted, or bolted. Welded and/or bolted field connections shall be provided as indicated in the drawings.

2.3 SHOP PAINTING

- A. Steel shall be thoroughly cleaned of all loose mill scale, rust spatter, slag or flux deposit, oil, dirt, and other foreign matter. One coat of shop paint shall be applied as specified above to all surfaces, except as follows:
 - 1. Machined surfaces, surfaces that are to be encased in concrete, surfaces that are to receive sprayed-on fire-proofing, and edges and surface areas adjacent to field welds shall not be painted.
 - 2. Parts and surfaces which will be inaccessible after assembly or erection other than those surfaces listed above shall have two coats of paint. A differentiating color for the second coat shall be used.
- B. Surfaces must be dry when the paint is applied.

- C. Machined or milled surfaces shall be protected from corrosion by a suitable coating.
- D. Shop painting shall be compatible with the finish coating specified in Section 09 91 00.

PART 3 -- EXECUTION

3.1 INSPECTION

- A. All materials and workmanship to be furnished under this section shall be subject to inspection in the mill, shop, and field by the Engineer, or by qualified inspectors retained by the OWNER.
- B. Inspection will be conducted without expense to the Contractor; however, inspection shall not relieve the Contractor of his responsibility to furnish materials and workmanship in accordance with contract requirements.

3.2 ERECTION

- A. Erection and welding shall conform to the standards listed in Paragraph 1.4 above. Field cutting of structural steel is not permitted without the express permission of the structural engineer for each instance.
- B. Column base plates and leveling plates shall be set level to correct elevations and temporarily supported on wedges or shims of steel until the supported members have been plumbed and grouted solid under the entire bearing area with non-shrink grout as specified in Paragraph 2.1, Item D. Templates shall be furnished or constructed on the job as required for the proper setting of anchors and bearing plates. During the progress of the work, the Contractor shall make periodic checks to see that a proper set is maintained.
- C. Framing shall be erected true and plumb. All work during the progress of erection shall be securely connected to resist all dead load, wind, and erection stress, including loads from erection equipment and its operation. The Contractor shall provide all necessary temporary bracing, leaving it in place as long as required for safety, then remove it at the proper time.
- D. Vertical plumbness deviation for individual members shall not exceed one five-hundredth of the clear height of the member.
- E. Immediately after erection, field connections, weld burns, and abraded surfaces shall be repainted. Loose and scaling paint shall be removed by scraping and wire brushing to sound metal spot prime as necessary. Paint shall not be applied when temperatures are below 50°F, or when surfaces are damp or frosted.

**** END OF SECTION ****

SECTION 32 80 00 - IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes labor, materials, equipment, and accessories to provide the following:

1. Irrigation System, including:
 - (a) Water Supply and Piping
 - (1) Water Supply
 - (2) Water Supply Cabinet
 - (3) Water Meter
 - (4) Backflow Prevention Device
 - (5) Pipe/Plumbing
 - (6) Swing Joints
 - (7) Sleeving
 - (b) Controls and Wiring
 - (1) Irrigation Decoder Controller
 - (2) Rain Sensor
 - (3) Flow Sensors
 - (4) Surge Protection
 - (5) Field Decoders
 - (6) Electrical
 - (c) Valves
 - (1) Master Valves
 - (2) Isolation Valves
 - (3) Quick Coupler Valves
 - (4) Drip Zone Valve Kits
 - (5) Service Boxes
 - (d) Drip Irrigation Equipment
 - (1) Drip Tubing
 - (2) Operation Indicator
 - (3) Air Relief Valve
 - (4) Flush Valve
 - (5) Root Watering System

1.2 SUBMITTALS

- A. Submit product information and shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
- B. Submit the following information:
 - 1. Submit the following shop drawings:
 - (a) Irrigation Layout
 - 2. Submit the following product information:
 - (a) Water Supply and Piping
 - (1) Water Supply
 - (2) Water Supply Cabinet
 - (3) Water Meter
 - (4) Backflow Prevention Device
 - (5) Pipe/Plumbing
 - (6) Swing Joints
 - (7) Sleeving
 - (b) Controls and Wiring
 - (1) Irrigation Decoder Controller
 - (2) Rain Sensor
 - (3) Field Decoders
 - (4) Flow Sensor
 - (5) Surge Protection
 - (6) Electrical
 - (c) Valves
 - (1) Master Valves
 - (2) Isolation Valves
 - (3) Quick Couplers
 - (4) Service Boxes
 - (d) Drip Irrigation Equipment
 - (1) Drip Tubing
 - (2) Operation Indicator
 - (3) Air Relief Valve
 - (4) Flush Valve
 - (5) Root Watering System
- C. Submit a Statement of Qualifications for the irrigation installer.
- D. Submit an As-Built Survey.

1.3 COORDINATION

- A. Source of Water: Coordinate water supply with Mechanical Contractor.
- B. Power: Coordinate power supply with Electrical Contractor.
- C. Sleeving: Coordinate irrigation sleeving with paving and utility contractors.

1.4 DEFINITIONS

- A. Lateral Piping: Downstream from control valves to sprinklers, specialties, and valves.
- B. Main Piping: Downstream from water supply connection to control valves.
- C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 volts or for remote-control, signaling power-limited circuits.
- D. Station/Zone: A group or area of sprinklers piped that operate simultaneously by design and independently of other stations/zones.
- E. Application/Precipitation Rate: The rate at which water is applied to a given area by sprinkler(s) and emitter(s), usually expressed as depth per unit time (inches per hour).
- F. Nozzle/Nozzle Orifice: The discharge emission point of a sprinkler installed to control the volume of water discharge, distribution pattern, and droplet size.
- G. Matched Application/Distribution Rate: A best design and installation practice whereby sprinklers on the same station discharge irrigation water at a rate that is matched to other sprinklers within the station regardless of arc of throw.
- H. HydroZone: An area of an irrigation system where microclimate factors that influence the watering schedule are similar including, but not limited to, plant type, soil type, solar radiation, slope, and wind run.

1.5 QUALIFICATION FOR THE IRRIGATION INSTALLER

- A. Shall have the following minimum qualifications and experience. Submit a Statement of Qualifications which includes:
 - 1. Properly licensed company in good standing specializing in performing the work of this section with minimum 5 years of experience.
 - 2. The selected installing installer shall be prepared to furnish proof of not less than 5 successful installations of projects of similar scope and complexity within the past 3 calendar years including but, not limited to successful installation, programming and operation of decoder irrigation control systems and SMART technology.
 - 3. Iowa state law requires all low voltage wiring to be installed & maintained by a company that holds a Low Voltage Contractor's License.
 - 4. The selected Irrigation Contractor shall be an employer of workers that include not less than one Certified Irrigation Installer in good standing as accredited by The Irrigation Association, Falls Church, VA and who shall be currently employed by the selected installing installer and who shall personally conduct or oversee the conduct of all work upon this project.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle materials in accordance with manufacturer's recommendations, in such a manner as to prevent damage. Store materials above ground on wood pallets or blocking.
- B. Inspect all products at delivery to determine that the proper materials have been delivered and are usable. Damaged material shall not be incorporated into the work.
- C. Handling of materials as recommended by manufacturer.

1.7 EXTRA MATERIALS

A. Upon completion of the work furnish the following for the Owner's maintenance stock:

1. Quick Coupler Keys: 2
2. Valve solenoid/decoder: 2

PART 2 - PRODUCTS

2.1 WATER SUPPLY AND PIPING

A. Water Supply:

1. Refer to utility plans for water supply material.
2. All above ground piping shall be either copper or DIP piping. No PVC piping above ground even if enclosed in a water supply cabinet.

B. Water Supply Cabinet:

1. Sized to enclose the water meter, backflow prevention device, valves, and related miscellaneous piping.
2. 14 Gauge Galvannealed Steel
3. Peaked roof to shed water
4. Venting holes on ends under cover
5. Open bottom with flange for mounting to concrete pad
6. Powder Coated Green
7. 14 Gauge Stainless Steel hinge with ¼" pin bolted on with stainless steel fasteners
8. 7" heavy duty safety hasp
9. Approved manufacturers:
 - (a) Povolny Specialties
 - (b) Or approved equal

C. Water Meter

1. Use water meter brand and model specified by the jurisdiction monitoring the project. Size meter according to minimum specifications contained herein.

D. Backflow Prevention Device

1. ASSE® Listed 1013.
2. Shall be supplied with full port ball valves.
3. The main body and access covers shall be bronze (ASTM B 584).
4. The seat ring and all internal polymers shall be Noryl™ and the seat disc elastomers shall be silicone.
5. The first and second checks shall be accessible for maintenance without removing the relief valve or the entire device from the line.
6. Approved manufacturers:
 - (a) Zurn Wilkins

(1) Model 975.

(b) Or approved equal

E. Piping and Plumbing

1. General: All materials and equipment furnished under this Contract shall be new. All pipe to include manufacture date.

2. Main Line Piping:

(a) Polyvinyl-Chloride Pipe (PVC):

(1) For pipe sizes 1" and greater.

(2) Virgin, high impact, polyvinyl chloride (PVC) pipe (Class 200, SDR 21), having a minimum 200 psi working pressure rating. PVC pipe shall be continuously and permanently marked with manufacturer's name, material, and schedule or type.

(3) Pipe shall meet the requirements of ASTM D2241 and D2672, latest revision. Materials shall meet the requirements of ASTM D1784, latest revision.

3. Lateral Line Piping

(a) Polyvinyl-Chloride Pipe (PVC):

(1) For pipe sizes 1" and greater.

(2) Virgin, high impact, polyvinyl chloride (PVC) pipe (Class 160, SDR 26), having a minimum 160 psi working pressure rating. PVC pipe shall be continuously and permanently marked with manufacturer's name, material, and schedule or type.

(3) Pipe shall meet the requirements of ASTM D2241 and D2672, latest revision. Materials shall meet the requirements of ASTM D1784, latest revision.

4. Pipe Fittings:

(a) Pipe fittings for 3" diameter and less shall be Schedule 40 PVC, solvent welded.

(b) Must conform to ASTM D-1784 and ASTM D-2466.

F. Swing Joints:

1. Schedule 40 PVC.

2. Approved manufacturers:

(a) Spears

(1) PVC swing joint riser

(b) Or equal

G. Sleeving:

1. Schedule 40 PVC.

2.2 CONTROLS AND WIRING

A. Irrigation Decoder Controller

1. The controller shall be wall or pedestal mounted.

2. Automatic controller, microprocessor solid state control with visible readout display, temporary override feature to bypass cycle for inclement weather, timer for a 60 station system and expandable to 150 stations, programmable for 7 days in quarter hour increments, with automatic start and shutdown.
 3. Controller Housing: NEMA 250 Type 3; weatherproof, watertight, with lockable access door.
 4. Wire Conductors: Color coded.
 5. The controller shall include ten (10) independent programs, six (6) start times per program, day of week, odd/even or interval scheduling.
 6. The controller shall include programmable rain delay up to 31 days and a water window calculator.
 7. The controller shall be able to run all decoders on #14 AWG cable up to 15,000 feet in any direction from the controller.
 8. The two-wire field controllers shall include a rain sensor connection.
 9. The controller shall be upgradeable to a central control system.
 10. Grounding Rod: Provide four (4) 8' long grounding rods at controller and at remote sensors. Refer to Details for locations.
 11. Approved Manufacturer:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model A2C-150D-M
 - (b) Or approved equal.
- B. Rain Sensor
1. Wireless Rain or freeze sensor with 500 foot range.
 2. Smart Bypass allows for system override at any time and resets automatically.
 3. Rain/Freeze protection with digital programming and digital LCD display.
 4. Freeze shut-off can be set from 35° to 45°F (2° to 7°C).
 5. Approved Manufacturer:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model RAIN-CLIK.
 - (b) Or approved equal.
- C. Field Decoders
1. Field Decoders are used to control station and master valves.
 2. The decoder model number first digit represents the number of decoder addresses (stations or master valves) and the last digit the quantity of solenoids that can be activated per address.
 3. Each decoder is factory programmed with a unique three, four or five digit address that is utilized to associate with a station or master valve.
 4. Approved Manufacturer:

(a) Hunter Industries, San Marcos, CA.

(1) Model ICD-100.

(b) Or approved equal.

D. Electrical

1. Electric decoder wire from controller to automatic valves decoders shall be UF approved direct burial wire. 14 gauge wire.
2. Use decoder wire that conforms to manufacturer recommendations and/or is polyethylene double-jacketed or UF-B UL PVC double-jacketed two-conductor solid core designed for direct burial. Use conductors that are soft drawn, annealed, solid copper conforming to ASTM 33 (tinned or non-tinned). Use conductor insulation that is 4/64-inch thick polyvinyl chloride (PVC), conforming to UL Standard #493 for thermoplastic-insulated style UF (Underground Feeder), rated at 140oF (60oC). Conductors laid in parallel encased in a single outer jacket of 3/64-inch thick, high-density, sunlight resistant polyethylene conforming to ICEA S-61-402 and NEMA WC5, having a minimum wall thickness of .045-inch. Color code the two conductors: one conductor is red and one is black. Use conductors of the same size. The distance from the controller to the end of any one wire run shall not exceed the maximum distance specified for the gauge of wire as described in corresponding tables for wire run lengths.
3. Make secondary wire connections with 3M DBR-6® DBG® or equivalent type splice kits or manufacturer recommendation for irrigation control installations. Provide expansion turns with 24 inches of slack at each electric valve. All wiring shall be installed in accordance with state, local and national electrical codes requirements and as per control and wire manufacturer recommendation.

E. Secondary Field Wiring and Splice Kit

1. Approved Manufacturers:
 - (a) Coleman Cable
 - (1) Model #51452
 - (b) Paige
 - (1) Models P7072D-Rev12, P7296D, P7350D, P7354D
 - (c) Regency
 - (1) Model 14/2 Maxi Cable®
 - (d) Or approved equal.

2.3 VALVES

A. Master Valves:

1. Designed to provide reliable remote-control operation of the irrigation system.
2. Valves shall be sized as shown and noted on the Drawings and shall be installed in valve boxes of appropriate size and type as described under valve boxes.
3. Plastic Industrial Smart Valves. Low Flow Operating Capability, Globe Configuration.
4. The valve body and bonnet shall be constructed of heavy-duty and ultra-violet resistant plastic.

5. Shall have a flow control handle to adjust water flow as needed.
 6. Shall include a 24 VAC 50/60 Hz solenoid capable of 2-wire operation.
 7. Operating pressure range of 20-200 psi (1.38-13.8 bar).
 8. Shall accommodate an optional field-installed pressure regulating dial.
 9. Includes a five-year trade warranty.
 10. Approved Manufacturers:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model IBV-DC
 - (b) Or approved equal
- B. Isolation Valves:
1. Valves shall be the same size as mainline pipe diameter at valve location.
 2. All ball valves constructed of Lead free 304 or 316 stainless steel.
 3. Bronze or brass ball valves will not be allowed.
 4. Stainless steel lever handle
 5. 1000 PSI CWP (cold working pressure)
 6. Size range 1/4-inch to 4 inches.
 7. Approved Manufacturers:
 - (a) Leemco, Inc., Colton, CA (909) 422-0088
 - (1) LBT-SS
 - (b) Or approved equal.
- C. Quick Coupler Valves:
1. As presented in the installation details.
 2. Brass construction, 3/4-inch nominal size, operating pressure 5-125 psi (35-860 kPa) with locking rubber or vinyl cover.
 3. The body shall be constructed as a two-piece design for easy servicing.
 4. Operating flow rate up to 20 gpm.
 5. Operating pressure range of 5-125 psi.
 6. Include a three-year trade warranty.
 7. Use pre-manufactured triple swing joint. Quality of manufactured product shall meet or exceed that of products manufactured by Rain Bird, Spears, Lasko, or approved equal.
 8. Use pre-manufactured bolt on anchor. Approved manufacturer is HARCO or approved equal.
 9. Filter Fabric: Use a spunbond polyester 3.5 oz per square yard landscape fabric.
 10. Approved Manufacturers:
 - (a) Hunter Industries, San Marcos, CA.

(1) Model HQ-33DRC.

(b) Or approved equal.

D. Drip Zone Valve Kits

1. Control zone kit assemblies for dripline irrigation stations shall include control valve, filtration, and pressure regulation components sized to meet the hydraulic demands and flow requirements of the stations being served.
2. Pressure regulator reduces system pressure to levels suitable for drip irrigation.
3. 150 Mesh (100 micron) filter.
4. Three-year trade warranty.
5. Compatible with 2-wire decoder systems.
6. Operating flow range: 0.3 to 20.0 gpm (1.13 to 75.7 l/m)
7. Inlet pressure: 15 – 150 psi (1.0 to 10.3 bar)
8. Approved Manufacturer:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model ICZ-101-40.
 - (b) Or approved equal.

E. Service Boxes

1. Service Boxes for Electric Remote-Control Valves, Master Valves, Flow Sensors, Drip Control Kits, Isolation Valves, Quick Couplers, Air Relief Valves, Grounding Rod, Moisture Sensors, and Wire Splices shall conform to the following:
 - (a) Service boxes shall be HDPE Type A, Class III, green in color. Box shall be minimum 19-inches (475 mm) long by 14-inches (350 mm) deep with key-lockable hinged lid.
 - (b) Service box shall be of a size that provides adequate space for repairs.
 - (c) See service box size chart for service box sizes.
 - (d) Service boxes shall be placed on a bed of gravel sized 6 inches larger than box perimeter with a depth not less than 12 inches.
 - (e) Gravel must be placed prior to the placement of the service box.
 - (f) Approved Manufacturers:
 - (1) Carson
 - (2) Pentek
 - (3) Rain Bird
 - (4) Or approved equal.

2.4 DRIP IRRIGATION EQUIPMENT

A. Drip Tubing:

1. The pressure-compensating type shall incorporate a circular silicon rubber disk designed to flush at startup, shutdown and during the irrigation cycle to inhibit debris collection.
 2. Pressure operating range: 8.5 to 60 psi (,58 to 4,14 bar)
 3. Flow rates: 0.9 gph (3,5 //hr)
 4. Emitter Spacing: 12".
 5. Drip grid rows shall be placed at 12 inch intervals.
 6. The drip tubing shall be a pre-bonded emitter type.
 7. Required filtration: 120 mesh.
 8. Dual layered polyethylene construction with resistance to chemicals, algae growth abd UV damage.
 9. Approved Manufacturer:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model HDL-09-12-PC.
 - (b) Or approved equal.
- B. Operation Indicator:
1. Constructed with UV resistant, heat impact plastic.
 2. Operating Pressure: 20 to 50 psi (1.4 to 3.5 bar)
 3. Includes 16" of durable ¼" distribution tubing.
 4. Approved Manufacturer:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model ECO-INDICATOR.
 - (b) Or approved equal.
- C. Air Relief Valve:
1. O-ring seal type with inlet threads of 1/2-inch MPT threads.
 2. Constructed of corrosive-proof engineering thermoplastics.
 3. The air vent/vacuum relief valve shall be rated at a maximum operating pressure of 100 PSI.
 4. Approved Manufacturer:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model PLD-AVR ¾".
 - (b) Or approved equal.
- D. Flush Valve:
1. Operating Pressure: 0 to 60 psi (0 to 4.1 bar)
 2. Accepts tubing with an O.D. of 0.630" to 0.669" (16-17mm)
 3. Recommended for use above surface only.

4. Approved Manufacturer:
 - (a) Hunter Industries, San Marcos, CA.
 - (1) Model PLD-BV.
 - (b) Or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. All spray, rotary and rotor sprinklers shall have head-to-head coverage. Balance the precipitation rate among all sprinklers within the zone.
- B. Layout work in general conformance with the Drawings. Adjust nozzles, sprinkler arcs, or head and pipe locations to complement actual field conditions.
- C. Add supplemental sprinklers as necessary to provide head-to-head coverage.

3.2 EXAMINATION

- A. Examine the area where the irrigation system will be constructed.
- B. Verify the location of existing and other relative proposed structures and utilities prior to excavation.

3.3 WATER SUPPLY AND PIPING INSTALLATION

- A. Water Supply Installation
 1. All assembly parts (threaded nipples, fittings, etc.) shall be galvanized or brass per local codes and requirements.
- B. Water Supply Cabinet Installation
 1. Provide 4" concrete pad under water meter and backflow prevention device.
 2. All items within the water supply cabinet shall meet all local plumbing and electrical codes.
- C. Pipe Installation
 1. Excavating and Backfill: Perform excavations for installation of irrigation system. Backfill trenches and restore grade to elevation existing before excavating.
 - (a) Pitching pipe to allow for winter drainage by gravity method will not be required. Provide facilities for drainage by blow-out method and construct system in such a manner that will ensure positive winter protection.
 - (b) Provide a minimum of 6 inches between parallel pipelines.
 - (c) Provide the following minimum cover from finish grade:
 - (1) 12-inch over lateral lines.
 - (2) 18-inch over main lines.
 - (d) Cap piping securely at end of each day's work to prevent entrance of foreign material.
- D. Sleeving Installation
 1. Enclose pipe and wire in PVC sleeves at each pavement crossing.

2. Provide 1.5 foot section of rebar with 6" minimum bury at each end for future locating. Sleeving shall be directionally bored or mechanically pushed if pavement is existing and as shown on plans.
3. Damage to pavement above sleeving shall be repaired by the Contractor, at their own expense and to the satisfaction of the Landscape Architect.

E. Valve Installation

1. Provide a minimum 4 inch space between the top of the valve and bottom of box cover and a minimum 4 inch space between the bottom of valve and top of gravel sump.

3.4 CONTROLS AND WIRING INSTALLATION

A. Controls Installation

1. Electrical Work

(a) Installation of Wire:

- (1) Install wire with main line piping in same trench.
- (2) Provide sufficient slack at each connection to valve to facilitate future service.
- (3) Underground splices shall be waterproofed with wire connectors and Direct Burial Splice Kit (DBY) as manufactured by 3M Company.

(b) Iowa state law requires all low voltage wiring to be installed & maintained by a company that holds a Low Voltage Contractor's License.

(c) The Irrigation Contractor shall be responsible for hard wiring controller to power source(s), and for low voltage wiring from controller to zone valves. Coordinate with Electrical Contractor.

(d) Wherever splices are made in the two-wire path or decoder wiring, they shall be placed in a valve box.

B. Rain Sensor Installation

1. Sensor may be mounted on fence, fence post, gutters, or building walls.
2. Sensor should not be mounted under trees, eaves, or in areas affected by sprinkler system operation.
3. Verify location of rain sensor with Owner prior to installation.

C. Decoder Installation

1. Wire Splice Marking – All wires in a valve box shall be permanently identified as to their routing direction or the holes they feed using a permanent marking pen and marking on the cable outer insulation jacket or using some other suitable permanent tag (metal, plastic, etc.) to identify the wire.
2. Wherever splices are made in the two-wire path or decoder wiring, they shall be placed in a valve box.

D. Flow Sensor Installation

1. Provide a clear, unobstructed distance of at least 10X's the pipe diameter upstream of the sensor and at least 5X's the pipe's downstream of the sensor.

3.5 VALVE INSTALLATION

A. Service Box Installation

1. Service boxes shall be flush with finished grade.
2. All control valves, isolation valves, quick couplers, and drip equipment shall be installed in valve boxes that provide adequate space for valve servicing without excavation.
3. Provide waterproof connections where control wires attach to valve.
4. Center equipment in an upright position within the service box.
5. Provide a 6-inch gravel sump under each service box.
6. Gravel sump must be placed prior to service box placement.
7. Locate service boxes in planting areas whenever possible.

3.6 PERFORMANCE TEST

A. TEST the SYSTEM

1. Notify Landscape Architect, in writing, that all systems are in place and ready for a performance test.
2. Schedule a performance test with Owner, Landscape Architect, Architect and Contractor and verify
3. Provide staff to operate the irrigation system for the Landscape Architect during the performance test.
4. Performance requirements:
 - (a)

3.7 CLOSEOUT ACTIVITIES

- A. Irrigation Installer shall complete initial set-up and programming of the system controller including:
 1. Decoder/valve assignment.
 2. Rain Sensor operation and placement.
 3. Base programming
 4. Advanced programming such as master valve and flow sensor verification and alarm actions.
- B. Instruct Owner's personnel in operation and maintenance of system, including adjusting of sprinklers. Use operation and maintenance data as basis for demonstration.
- C. Provide the testing as indicated in previous sections of the specifications.
- D. Demonstrate the operations of the systems as indicated in the project specifications.
- E. Acceptance shall be predicted upon a successful demonstration of the operation of the system as described and demonstrating a fully functional system in automatic operation for a period of 14 days prior to final walk-through and acceptance.

- F. Prior to final acceptance, provide on-site, face-to-face verbal instructions to the Owner's operating personnel for a period of not less than 4 hours. Provide Maintenance and Operating Instructions for the newly installed irrigation system equipment in the form of manual(s) as follows:
1. Unless otherwise noted, provide irrigation operation and maintenance information in one (1) 3-ring binder and one (1) electronic transmission with table of contents and index sheet. Provide sections that are indexed and labeled. Provide the following information as applicable to this installation:
 - (a) Catalog cut sheets for control system, valves, sprinklers, pipe and fittings, wire and wire connectors, ID tags, shop drawings, and all other irrigation equipment shown or described on the drawings and within these specifications.
 - (b) Manufacturer's Operation and Maintenance manuals.
 - (c) Manufacturer's Technical Service Bulletins.
 - (d) Manufacturer's Warranty Documentation.
 - (e) Software License Information.
 - (f) All computer central control installation, operation, programming materials, warranty identification information and manufacturer-sponsored technical support contact information.
 - (g) All weather station installation, operation, programming materials, warranty identification information and manufacturer-sponsored technical support contact information.
 - (h) Printed depictions of computer central control program settings, schedule settings and parameters at the time of owner training including color-coded depictions, graphics, tables, charts and other material necessary to efficiently and effectively convey the computer central control system programming and schedule parameters.
 - (i) Recommended routine maintenance inspections for weekly, monthly and annual inspections and recommended actions for the inspections and a recommended method for recording the findings of the inspections.
 - (j) Predictive schedule for component replacement.
 - (k) Listing of technical support contacts.
 - (l) Operation and maintenance submittal package shall be complete prior to review. Incomplete submittals will be returned without review.
 2. Record Drawings:
 - (a) As-built information completed to the satisfaction of the Landscape Architect, in electronic CAD-based format and two hardcopies and any related information shall be delivered to the owner upon completion and shall be the responsibility of the selected irrigation installer to complete and turn-in to owner.
 - (b) Plans, layouts, calculations and locations shall be proposed on AutoCAD Release 2024 (or newer) at scale equal to the design scale including detailed drawings illustrating known field adjustments to design drawings including but not limited to pipe sizes and lengths; fittings, locations, types and sizes of sprinkler heads; controls; point of connection including backflow preventers, meter, and related; valves and decoders; location and mounting details of electrical control equipment; complete wiring diagram showing

routes and wire sizes; wiring details and source of current and connections to existing services. Record locations of all concealed components of the piping system.

- (c) Include a professionally prepared and presentable station chart and controller timing schedule showing the controller, each irrigation station and its control valve and corresponding decoder information; and show the time settings or relevant SMART control programming information for each automatic controller zone.
- (d) Reproducible "as-built" drawings. Submit information for approval by the Landscape Architect indicating the "as-built" conditions for the irrigation system to the Landscape Architect as marked-up copies of the full-sized bid documents posted with all addendum, clarification and approved modifications. Upon approval by the Landscape Architect, the Installer produced marked-up "as-built" irrigation drawings shall be submitted for preparation of the electronic "as-built" drawing(s) for the irrigation system.

3. Controller Chart:

- (a) Prepare a map diagram showing location of all valves, lateral lines, and route of the control wires. Identify all valves as to size, station, number and type of irrigation. "As-built" drawings shall be submitted and approved before charts are prepared.
- (b) Provide one controller chart showing the area covered by controller for each automatic controller supplied at the maximum size controller door will allow. Chart shall be one or more reduced drawing sheets of the actual "as-built" system in sections that result in easy to read or decipher format. If controller sequence is not legible when the drawing is reduced to door size, the drawing shall be enlarged to a size that is readable and placed folded, in a sealed plastic container inside the controller door or posted professionally next to the controller.

4. Spare Parts:

- (a) Upon completion of the work furnish the Owner the following for their maintenance stock:
 - (1) Quick Coupler Keys: 3
 - (2) Decoder: 5
 - (3) Drip grid operation indicators: 5

3.8 INSTRUCTIONS

- A. General Requirements: After completion and testing of the system, the Contractor shall instruct the Owner's personnel in the proper operation, maintenance, winterizing and reactivation of the system.

3.9 SEASONAL DRAINAGE

- A. General Requirements: Winter drainage shall be accomplished by replacing the water with compressed air. First year winterizing, including Fall blow-out and Spring start-up, to be accomplished by Contractor.

3.10 CLEANING

- A. General Requirements: Contractor shall be responsible for clean-up by removing remnants of materials, containers, debris, and other construction materials and equipment used in this work.

3.11 WARRANTY

- A. For a period of one year from date of final acceptance of the work performed under this Contract, the Contractor shall promptly furnish and install, without cost to the Owner, all parts which prove defective in material and workmanship.

END OF SECTION

SECTION 32 91 13 – STRUCTURAL SOIL

1) General

A. Summary

i) Section Includes:

- (a) All labor, materials, equipment, and supervision required to furnish and install the structural soil to finished grade for designated tree plantings, as shown on the Plan Sheets or directed by the Engineer.

B. Measurement and Payment

i) Structural Planting Soil

- (a) Payment shall be per cubic yard and shall include all costs to supply, mix, haul, place and compact the structural soil material. All costs associated with subgrade preparation shall be included in this bid item. Excavation for structural soil is considered incidental.

C. Submittals

- (a) Product labels and data sheets
- (b) Chemical analysis of structural soil
- (c) 1 Gallon sample of structural soil mix

2) Materials/Products

A. Clay Loam

- i) Clay Loam shall be a “loam” based on the “USDA classification system” as determined by mechanical analysis (ASTM D-422) and it shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than one-half inch, lumps, plants and their roots, debris and other extraneous matter over one inch in diameter or excess of smaller pieces of the same materials. It shall not contain toxic substances harmful to plant growth. It shall be obtained from naturally well-drained areas, which have never been stripped of topsoil before and have a history of satisfactory vegetative growth. Clay loam shall contain not less than 2% or more than 5% organic matter as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F., plus or minus 9 degrees.

- (a) Mechanical analysis for a Loam/Clay Loam shall be as follows:

(b) Textural Class % of Total Weight

Gravel	less than 5%
Sand	20-45%
Silt	20-50%
Clay	20-40%

- (c) Chemical analysis: Meet or be amended to meet the following criteria:

- (i) pH between 5.5 to 6.5
- (ii) Percent organic matter 2% - 6% by dry weight
- (iii) Nutrient levels as required by the testing laboratory recommendations for the type of plants to be grown in the soil
- (iv) Soluble salt less than 1.0 Millimho per cm

(v) Cation Exchange Capacity (CEC) greater than 10

(vi) Carbon/Nitrogen Ratio less than 33:1

(d) No topsoil shall come from USDA - classified prime farmland.

B. Crushed Stone

- i) Crushed Stone shall be either granite or limestone. The size of the crushed stone shall be 0.75 inches to 1.5 inches allowing for 5% to 10% to be greater than 1.5 inches, and 5% to 10% less than 0.75 inches.
- ii) Acceptable aggregate dimensions will not exceed 2.5:1.0 for any two dimensions chosen.
- iii) Minimum 90% with one fractured face, minimum 75% with two or more fractured faces.
- iv) Results of Aggregate Soundness Loss test shall not exceed 18%.
- v) Losses from LA Abrasion tests shall not exceed 40%.

C. Fertilizer

- i) Commercial fertilizer shall comply with State and United States fertilizer laws. Fertilizer shall be formulated for mixing into the soil and be certified by the manufacturer to provide controlled release of nitrogen continuously for a period of no less than nine months and no more than 12 months.
 - (a) Fertilizer percentages of weight of ingredients and application rates shall be as recommended by the soil testing results. Contractor to coordinate any required testing and action required.

D. Sulfur

- i) Sulfur shall be commercial granular, 96% pure sulfur, delivered in containers with the name of the manufacturer, material and analysis appearing on the container.
- ii) Sulfur used to lower soil pH above 6.5 shall be ferrous sulfate formulation.

E. Lime

- i) Agricultural limestone containing a minimum of 85% carbonates. Minimum gradation: 100% passing 10 mesh sieves; 98% passing 20 mesh sieves; 55% passing 60 mesh sieve and 40% passing 100 mesh sieve.

F. Hydrogel

- i) Hydrogel shall be a potassium propenoate-propenamide copolymer Hydrogel (Gelscape® Hydrogel Tackifier) as manufactured by Amereq Corp. (800) 832-8788 or approved equal.

G. Water

H. The installing contractor shall be responsible to furnish his own supply of water (as needed)

I. Structural Soil Blend

- i) A uniformly blended mixture of crushed stone, clay loam and hydrogel mixed in the following proportions:

(1) <u>Material</u>	<u>Unit of Weight</u>
Specified Crushed Stone	100 units dry weight
Specified clay loam	20-25 units (to achieve minimum CBR of 50)
Hydrogel	0.035 units dry weight

3) Execution

A. Mixing and Quality Control

- i) All structural soil mixing shall be performed at the producer's yard using appropriate soil measuring, mixing and shredding equipment of sufficient capacity and capability to assure proper quality control and consistent mix ratios. No mixing of Structural Soil at the project site shall be permitted.
- ii) Should the independent laboratory test results of the clay loam reveal a need to amend it, to meet specifications, the amending materials should be added to the clay loam following the rates and recommendations provided by the licensed producer of the structural soil.

B. Underground Utilities and Subsurface Conditions

- i) The installing contractor shall notify the engineer of any subsurface conditions which will affect the contractor's ability to install the structural soil
- ii) The installing contractor shall locate and confirm all underground utility lines and structures prior to the start of any excavation
- iii) The installing contractor shall repair any underground utilities or foundations damaged during the progress of the is work

C. Site Preparation

- i) Do not proceed with the installation of structural soil material until all walls, curbs, footings and utility work in the area have been installed. For site elements dependent on structural soil for foundation support, postpone installation of such elements until immediately after the installation of structural soil.
- ii) Excavate and compact the proposed subgrade to depths, slopes and widths as shown on the drawings. Maintain all required angles of repose of the adjacent materials as shown on the drawings. Do not over excavate compacted subgrades of adjacent pavement or structures.
- iii) Do not proceed with the installation of structural soil until the confirmation of the subgrade elevation and compaction and all utility work in the area has been installed. All subsurface drainage systems shall be operational prior to installation of structural soil.

D. Installation of Structural Soil

- i) Install structural soil in 6-inch lifts and compact each lift.
- ii) Compact all materials to at least 95% Proctor Density from a standard compaction curve AASHTO T 99 (ASTM D 698). No compaction shall occur when moisture content exceeds maximum as listed herein. Delay compaction if moisture content exceeds maximum allowable as directed by the engineer.
- iii) Bring structural soil to finished grades as shown on the drawings and protect from contamination as directed by the engineer.
- iv) The engineer may periodically check the material being delivered, prior to installation for color and texture consistency with the approved sample provided by the installing contractor as part of the submittal for structural soil. If the engineer determines that the delivered structural soil varies significantly from the approved samples, the engineer shall contact the licensed producer. Structural soil should not be stockpiled long-term. Any structural soil not installed immediately should be protected by a tarp or other waterproof covering.

E. Clean-Up

- i) Upon completion of the structural soil installation operations, clean areas within the contract limits. Remove all excess fills, soils and mix stockpiles and legally dispose of all waste materials, trash and

debris. Remove all tools and equipment and provide a clean, clear site. Sweep do not wash, all paving and other exposed surfaces of dirt and mud until the paving has been installed over the structural soil material. Do no washing until finished materials covering structural soil material are in place.

END OF SECTION

WATER MAIN INSERTION VALVES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental to watermain and service line construction as indicated on the drawings or as specified herein.

1.2 METHOD OF MEASUREMENT AND PAYMENT

- A. Measurement and compensation for the following items will be paid according to the referenced specification or as modified below:
 - 1. Insertion Valve
 - (a) Insertion valves installed under pressure shall be measured per EACH and paid for the size specified in the Schedule of Unit Prices, complete in place, at the appropriate unit price bid.
- B. The furnishing and installing of specific items and/or the performance of work under certain circumstances will not be individually paid in the absence of a specific bid item for the work. The costs will be included in the unit price bid for the water system items, as indicated. Such items of work include but are not limited to:
 - 1. Compaction, hydrostatic, leakage, disinfecting, coliform bacteria and conductivity testing will be included in the price bid for watermain.
 - 2. The cost to furnish and install water service couplings will be included in the unit price bid for water service pipe.

1.3 SPECIFICATION REFERENCES

- A. The following ASTM references will apply to this Section of the Project Manual, except as modified herein:
 - 1. ASTM A536
 - 2. ASTM D1248
 - 3. ASTM D1784
 - 4. ASTM D2412
 - 5. ASTM D2513
 - 6. ASTM D3261
 - 7. ASTM D3034
 - 8. ASTM D3350
- B. The following AWWA references will apply to this Section of the Project Manual, except as modified herein:
 - 1. AWWA C509 shall apply, except as modified herein.
 - 2. ANSI/AWWA C550 and C116/A21.16
 - 3. AWWA C651
 - 4. AWWA C900
 - 5. AWWA C906
- C. The following SUDAS references will apply to this Section of the Project Manual, except as modified herein:

1. SUDAS Section 5010, Pipe and Fittings.
 2. SUDAS Section 5020, Valves, Fire Hydrants, and Appurtenances.
 3. SUDAS Section 5030, Testing and Disinfection.
- D. Unless noted otherwise, the provisions in this section are in addition to the referenced specification.

1.4 SUBMITTALS

- A. Work plan for temporary water service.
- B. Watermain and Water Service Lines
 1. Valves & boxes – Certificates of Compliance.

PART 2 - PRODUCTS

- A. Insertion Valves
 1. The following insertion valves are permitted:
 - (a) Advanced Valve Technologies LLC, EZ Valve
 - (b) TEAM Industrial Services, InsertValve
 - (c) Insta-Valve Plus by Hydra-Stop, Inst.a-Valve Plus
 - (d) Approved substitution
 2. The equipment shall be capable of installation, without shutdown, at the locations shown and for pipe diameters indicated. The capabilities specified herein are minimum mandatory requirements that must be met by any insertion equipment or insertion valve offered.
 3. All insertion valves shall be provided as shown in the plans, schedules, and as specified herein. Buried insertion valves shall be non-rising stem, and wrench operated. The valve assemblies shall be furnished complete and adequate for the specified or shown purpose, and shall include all essential components of equipment, together with all mountings and other appurtenances normal and necessary for proper installation, whether shown or not. Insertion valves shall be equipped with a 2-inch square awwa operating nut, open left.
 4. The insertion valve shall be capable of pressure-tight assembly to exterior of the pipe in which flow is to be stopped at a working pressure not to exceed 250 psi.
 5. The insertion valve shall be constructed of a two (2) piece, ductile iron casting (top & bottom), to be bolted together, using ductile iron bolts with zinc alloy anodes (corrosion protection), manufactured to the ductile iron specification of astm a536.
 6. The insertion valve shall meet awwa c509 for resilient seal valves suitable for potable water service.
 7. The ductile iron gate shall have a resilient rubber seal 360 degrees around the gate and is expandable to the id (inside diameter) of the pipe.
 8. The valve stem shall be made of stainless steel with a tensile strength of 60,000 psi.
 9. The valve body shall have a corrosion protection coating.
 10. The insertion valve shall use stainless steel fasteners joining the valve bonnet to the valve top casting, unless otherwise noted in assembly drawings.
 11. The cutting / drilling: slot to thickness of wedge and 120 degrees across the pipe.
 12. The design of the valve shall have a satisfactory seal against the pipe exterior in the following ranges, using multiple gaskets if necessary. Valves shall conform to the operational (turns) requirements of awwa c509 with specified turns to open 'left'.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. Temporary Service

1. Before proceeding with the project, the Contractor will establish a work plan and submit the plan to the utility personnel and Engineer for review and comment. The plan will outline the method to be used to maintain service to the affected consumers and estimate the duration of any anticipated interruptions of service. The plan will include provisions to fully disinfect all temporary piping, valves, and fittings in accordance with AWWA C651. The Contractor is the sole party responsible to notify the Utility and consumers who may be affected by limitations and/or interruption of water service. Planned service interruptions will not exceed 6 hours in any 72 hour period unless previously approved by the Utility.
2. The Contractor will coordinate watermain shut-downs with the water utility at least 24 hours prior to the requested shut-down.
3. If the Contractor fails to provide water service to affected residents within the constraints specified above, an amount equal to \$500.00 may be deducted from the amount due the Contractor for each occurrence.

3.2 INSTALLATION OF PIPE AND FITTINGS

A. No existing valves or hydrants shall be operated by the Contractor except during an emergency or with specific authorization of the Owner.

B. Insertion valve

1. The equipment will be capable of installation, without shutdown, on pipe size diameters indicated. The capabilities specified herein are minimum mandatory requirements that must be met by any insertion equipment or insertion valve offered.
2. Equipment will consist of cutting unit, and a detachable rotary chain drive feed.
3. End mill cutting system will have a positive "stop" mechanism located on the opposite end of the rotary chain feed drive, to prevent under or over rotation of the 120 degree slotting operation.
4. The end mill cutting unit will be able to cut size (4.0-inch – 12.0-inch) for the pipe sizes indicated.
5. The end mill cutter will be manually advanced laterally by the work person to prevent cutter damage due to inclusions (hard spots, etc.) In the pipe. The cutter teeth will be able to be field replaceable if necessary.
6. The end mill process will constitute a rotary end mill that through the rotation of the valve casting, cuts a slot, 120 degrees across the top of the pipe only. This allows for the insertion of the resilient wedge mechanism.
7. During the end mill operation, the "chips" created by the end mill cutter will be flushed outside of the pipe.

******END OF SECTION******

Special Provision
Amending SUDAS SECTION 7030 – Concrete Unit Paving

The following language amends SUDAS Section 7030 – Sidewalks, Shared Use Paths, and Driveways pertaining to Concrete Unit Pavers. Unless otherwise indicated, all other specification information from Section 7030 remains unchanged.

1) General

- A. This technical specification amends Section 7030 as it pertains to the following bid items:
 - i) Crosswalk Unit Pavers with Asphalt Setting Bed and PCC Base
 - ii) Roadway Unit Pavers with Asphalt Setting Bed and PCC Base
 - iii) Sidewalk Unit Pavers with Sand Setting Bed and PCC Base
- B. Submittals
 - i) Add the following to item C:
 - (a) C. Concrete unit paver types and source, manufacturer specifications, samples of each type of paver showing color and texture, and polymeric sand joint filler.
 - (i) Prepare 6' x 6' mockup of each paver type and pattern combination as specified on plans and details.
- C. Measurement and Payment
 - i) Item F covers the measurement and payment for all concrete unit pavers with concrete subbase. Delete item 1. Revise item 2 per the following.
 - (a) F. Concrete Unit Pavers
 - (b) Delete.
 - (c) Concrete Unit Pavers with Concrete Base:
 - (i) Measurement: Measurement will be in square foot (SF) for the area of concrete unit pavers placed on a concrete base. The area of the concrete base will not be measured separately.
 - (ii) Payment: Payment will be at the unit price per square foot (SF) for the area of concrete unit pavers placed on concrete base.
 - (iii) Includes: Unit price includes, but is not limited to, subgrade preparation, concrete base, setting bed, neoprene mastic when specified, rebar, weep holes, concrete unit pavers and polymeric sand joint filler.

2) Products

- A. 2.03 Brick Pavers
 - i) Refer to B Sheet Series of the contract documents for details and K.00 for product info for concrete unit paver types, color and manufacturer information.
 - ii) Contractor shall furnish an additional 5% of each paver type to Owner at completion of project, palletized and delivered to City yard. Cost is incidental to paver unit bid price.
- B. 2.04 Setting Bed for Pavers
 - i) Delete item B - Pre-mixed High Performance Cold Mix. Only hot mix asphalt setting bed is allowed.
- C. 2.06 Brick Joint Filler
 - i) Replace text with the following:
 - (a) A. Joint filler for concrete unit pavers shall consist of polymeric sand. Acceptable products are Alliance – Gator Maxx or Techniseal NextGel, color to be approved by Engineer.
 - (b) B. Contractor shall furnish two (2) additional bags of joint filler to Owner at completion of project, delivered to City yard. Cost is incidental to paver unit bid price.

3) Products

- A. 3.06 Pavers with Pavement Base. Replace Item D with the following:

- i) Place the bricks/pavers by hand in straight courses with hand tight joints and uniform top surface. Set surface elevation of pavers 1/8 in. above adjacent drainage inlets, concrete collars or channels.
- ii) Fill gaps between units or at edges of the paved area that exceed 3/8 inch with pieces cut to fit from full-size unit pavers.
- iii) Verify final elevations for conformance to the drawings after sweeping the surface clean. Prevent final Concrete Paver finished grade elevations from deviating more than $\pm 3/8$ in. under a 10 ft straightedge or indicated slope, for finished surface of paving.
- iv) Paver to paver and paver to pavement lippage: No greater than 1/8 inch difference in height between adjacent pavers.
- v) Sweep dry joint filler into joints until the joints are completely filled.
- vi) Fog surface lightly with water to cure cement.
- vii) Clean any cement stains from bricks/pavers surface. Remove stains from other concrete surfaces.
- viii) Refer to paver manufacturer specifications for additional requirements.

END OF SECTION

Special Provision
Amending SUDAS SECTION 9030 – PLANT MATERIAL AND PLANTING

The following language amends SUDAS Section 9030 – Plant Material and Planting. Unless otherwise indicated, all other specification information from Section 9030 remains unchanged.

1) General

- A. This technical specification amends Section 9030 as it pertains to the following bid items:
 - i) Plants with Warranty, Perennial Ground Cover (1 Gal.)
 - ii) Plants with Warranty, Deciduous Shrubs (5 Gal.)
 - iii) Plants with Warranty, Deciduous Trees
- B. 1.08-B-Measurement and Payment: Replace with the following.
 - i) Measurement: Each perennial/shrub/tree/plant accepted in place will be counted. Amended planting soil shall be considered incidental to the deciduous tree bid item.
 - ii) Payment: Payment will be at the unit price for perennial/shrub/tree/plant installed and accepted. Payment will be made according to the following:
 - (a) 100% of unit price at initial acceptance (less retainage). Initial acceptance will be determined by Engineer. Plant material shall be thriving, fully maintained and show no signs of stress. Any plant that is damaged or showing signs of stress, will be rejected and shall not be accepted and shall be replaced. Only plant material that is accepted will be paid for. Upon substantial completion of entire project, a one-year warranty period will commence. Contractor shall provide one-year warranty certificate with start and finish dates as directed by Engineer. Contractor shall maintain all plant material as necessary, including watering, to ensure healthy, vigorous plant material throughout warranty period.
 - (b) At end of one-year warranty period, the Contractor and Engineer will conduct a thorough review of all plant material. Any plant material not thriving shall be replaced with same size, species and quality as originally planted, per contract documents, at no additional cost to the Owner.
 - iii) Includes: Unit price includes, but is not limited to, delivery, excavation, installation, watering, backfill, mulching, landscape fabric, wrapping, staking or guying, herbicide, maintenance during establishment and warranty periods, and replacements.

2) Products

- A. 2.01-C-Balled and Burlapped Plants: Replace with the following.
 - i) Approved Deciduous Tree growers/suppliers include the following, unless otherwise approved by Landscape Architect:
 - (1) Kankakee Nursery, St. Anne, IL – 815.937.9358
 - (2) Gerdes Nursery, Harvard, IL – 815.943.0305
 - (3) Johnson's Nursery, Menomonee Falls, WI – 262.252.4988
 - (4) Kaneville Tree Farm, Kaneville, IL – 630.557.2793
 - ii) Provide firm, moist, unbroken root balls of the specified size.
 - iii) Broken or loose root balls will be rejected.
 - iv) No manufactured or artificially produced or mudded-in root balls will be accepted.
 - v) A container grown trees are not accepted.
- B. 2.02-Mulch: Replace with the following.
 - i) Ground/shredded rubber mulch.
 - ii) As produced by Xylem LTD or approved equal.
 - iii) Color: Redwood

- iv) Woven, heavy duty commercial grade landscape fabric is considered incidental to planting and mulching.

B. 2.03-Backfill Material: Replace with the following.

- i) Planting backfill shall consist of amended planting soil as indicated on contract documents, unless otherwise specified.
- ii) Ensure backfill material is loose, friable, and free of clods and rocks 1 inches in diameter or larger. Do not use frozen or muddy soil as backfill material.
- iii) Amended planting soil backfill shall be paid separately as Amended Planting Soil bid item.

END OF SECTION

BID ALTERNATE 1 & 2 SPECIAL PROVISIONS

MCSD WELCOME CENTER PARKING LOT RECONSTRUCTION

These additional Special Provisions shall apply to the following Bid Alternates:

Bid Alternate 1 – MCSD Parking Lot Reconstruction

Bid Alternate 2 – MCSD Alley Reconstruction

S.P. 1 - POINTS OF CONTACT

The points of contact for the MCSD Welcome Center Parking Lot Reconstruction are as follows:

Marshalltown Community School District (Hereafter referred to in this Special Provision as Owner)

Eric Weeden

Safety and Security Coordinator

1002 South 3rd Ave

O: 641-754-1000

M: 641-351-5540

E: eweeden@marshalltown.k12.ia.us

Clapsaddle Garber Associates, Inc. (Hereafter referred to in this Special Provision as Engineer)

Adam C. Daters, PE

16 E Main St, Ste 400

O: 641-752-6701

M: 641-750-4152

E: adaters@cgaconsultants.com

S.P. 2 - INSURANCE:

The Contractor shall include Marshalltown Community School District and Clapsaddle-Garber Associates, Inc. as named insured on all insurance certificates, or as specifically related to the MCSD Welcome Center Parking Lot Reconstruction scope of work.

S.P. 3 - EMERGENCY ACCESS:

The construction zone shall be maintained to such a condition to permit emergency vehicles access to the construction area at all times.

S.P. 4 - PUBLIC ACCESS:

The Contractor shall apply all reasonable means of maintaining access to and from the MCSD Welcome Center at all times. Contractor shall notify Owner at least two weeks prior to site demolition. Alternate access to the MCSD Welcome Center is available on Main Street and the Alley.

S.P. 5 - CONSTRUCTION SCHEDULE AND SEQUENCE:

Work shall be allowed to commence in either 2025 or 2026, depending on the receipt of all local and state permits, see S.P. 15. The Contractor shall have 45 Calendar Days to complete the work upon commencement.

S.P. 6 - SUBSTANTIAL COMPLETION:

Substantial completion shall be defined as performance of all work on the contract including final landscaping, seeding, fertilizing and mulching. Substantial completion includes, but not limited to, restoring any previously disturbed areas that were disturbed during construction by paving, landscaping, seeding, fertilizing and mulching. Final acceptance of the project will not occur until all work is completed on the contract, the landscaping has been accepted in accordance with the contract documents and the project site has been cleaned up in accordance with the contract documents. The contractor, owner, and engineer shall perform a walk through and the contractor shall be issued a preliminary statement of completion prior to opening it to the public.

S.P. 7 - CONSTRUCTION SURVEY:

The Owner shall supply Construction Survey and Staking as required to include benchmarks, control points, utility flowlines, and pavement construction in 4 trips to the site. Any other Construction Survey the Contractor considers required for construction, must be provided by the Contractor. Any re-staking will be tracked separately and shall be charged to the Contractor.

S.P. 8 - SUBSURFACE SOIL DATA:

A Subsurface soil investigation has not been completed by the owner. Bidders are expected to examine the site and then decide for themselves the character of the material to be encountered. The Owner or the Owner's Engineer will not assume responsibility for variations of subsoil quality or conditions.

S.P. 9 - TESTS:

The owner will provide soil compaction testing and concrete testing.

S.P. 10 - CODES AND REGULATORY AGENCIES:

The Contractor shall comply with all applicable codes, regulations and the directions of all properly appointed authorities having jurisdiction.

S.P. 11 - SUBMITTALS:

The Contractor shall provide submittals for all material used on the project in accordance with the Specifications. The submittals shall be provided to the Engineer for review no later than one week prior to the Contractor needing to order the material to allow time for review. Submittals may be submitted electronically.

S.P. 12 - INCIDENTAL ITEMS OF WORK:

The Contractor is responsible for the performance of any item of work indicated on the Plans or Specifications even though these items may be omitted from the Bid Schedule. Such omission indicates that compensation for these omitted categories is considered included in those pay items which are listed in the Bid Schedule.

S.P. 13 - UTILITIES:

The Contractor is responsible for One-Call locates prior to starting construction. The Contractor shall provide proof of One Call tickets by providing the Engineer documentation of the Iowa One Call locate. The Engineer shall be notified immediately of any utility conflicts. The Contractor shall be responsible for the repair of any damage to utility lines or structures caused by the Contractor's work. The Contractor shall keep an As-Built record of encountered underground utilities with horizontal and vertical locations with notes on existing conditions and proposed repairs and changes.

S.P. 14 - PERMITS AND INSPECTIONS:

The Contractor shall obtain and furnish all necessary permits and inspection certificates for all material and labor furnished by the Contractor. Certificates shall be obtained from the proper inspection authorities. The cost of permits, certificates and all fees required (if any) in connection with the installation shall be borne by the Contractor.

S.P. 15 - IOWA DOT PERMITTING

No work shall commence until the Iowa DOT has issued any and all permits required for construction. The Owner is currently working to secure the required permits, and are estimated to be in place by Summer/Fall 2025.

S.P. 16 - SAFETY REQUIREMENTS:

The Contractor shall be solely and exclusively responsible for providing temporary ladders, guard rails, shoring, bracing, dewatering (if required), warning signs, night lights, and other safeguards desirable or required, and shall comply with all Federal, State and Municipal Safety Requirements. The Contractor shall be solely and exclusively responsible for the design, construction, inspection and continual maintenance of such facilities at all times. The Contractor shall be responsible for protecting the work and stored materials until completion and acceptance of the work by the Owner. It shall be the sole and exclusive responsibility of the Contractor to provide a safe place to work for all laborers and mechanics and other persons employed on or in connection with the project, and nothing in these Contract Documents shall be construed to give any of such responsibility to the Owner or Engineer.

S.P. 17 - DAMAGE:

The Contractor is responsible for damage to existing buildings and to existing facilities and is responsible for the repair of any damage caused by the Contractor's work. This shall include any and all work to repair or restore the Contractor's assembly and storage area.

S.P. 18 - CLEANUP OF THE PROJECT SITE:

The Contractor shall at all times keep the site of the work and adjacent premises as free from materials, debris, rubbish and trash as practicable, and shall remove same from any portion of the site if, in the opinion of the Owner, such materials, debris, rubbish or trash constitute a nuisance or are objectionable in any way to the public. The Contractor shall be responsible for the removal of dirt accumulation or any other debris on pavements resulting from the Contractor's operations on the work.

At the completion of the work, the Contractor shall remove all materials, implements, barricades, equipment, staging, piling, falsework, debris and rubbish connected with or caused by operations for such work immediately upon the completion of that work and shall leave the premises in

perfect condition insofar as affected by the work under this Contract. Fires for disposal of rubbish on the site are prohibited.

All cleaning shall be accomplished by a street sweeper or power broom to remove debris. Prior to sweeping, the area shall be cleaned of large debris, concrete, mud, etc., with an end loader. If the street sweeper or power broom does not adequately clean the pavement surface, the Contractor shall flush the surface with a water truck and then re-sweep.

S.P. 19 - RECORD DRAWINGS:

The Contractor shall make notes on the drawings showing any revisions made during construction. A copy of the record drawing notes shall be given to the Engineer upon completion.

S.P. 20 - COORDINATION BETWEEN OWNER AND ENGINEER:

The Project Engineer will handle all coordination and oversight with the contractor during construction. In the event the Contractor has questions, they shall be directed to the Engineer.

S.P. 21 - COORDINATION OF SPECIFICATIONS, PLANS AND SPECIAL PROVISIONS:

In case of a discrepancy within the various items included in the contract documents, the items shall prevail, or govern, in the following descending order:

1. Special Provisions
2. Plans, including plan notes
3. Supplemental Specifications
4. Standard General Specifications

S.P. 22 - MAINTENANCE BOND

The Contractor shall provide a separate Maintenance Bond to cover the scope of work in the MCSD Welcome Center Parking Lot Reconstruction. All requirements of the Maintenance Bond and any Warranties of the General Provisions or other related maintenance bond or warranty requirements shall apply.

STANDARD SPECIFICATIONS
FOR
WATER MAIN INSTALLATION

**MARSHALLTOWN
WATER WORKS**

FEBRUARY 2013

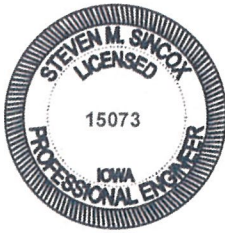
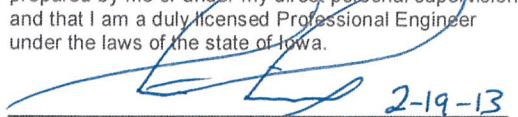
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the state of Iowa.  2-19-13 Steven M. Sincox, P.E. Date My license renewal date is December 31, 2013
Pages or sheets covered by this seal: <u>Supplementary Specifications, Figures 1-16</u>	



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SUPPLEMENTARY SPECIFICATIONS

The intent of these Supplementary Specifications is to modify the Statewide Urban Design and Specifications (SUDAS) in order to meet the regulations of the Marshalltown Water Works. The following items will modify the portion of the SUDAS Specifications indicated. The Supplementary Specifications only modify the sections indicated. All other sections of the SUDAS Specification that are not modified will remain in full force and effect.

SS-1 PIPE BEDDING AND BACKFILL

Modify Section 3010 Paragraph 3.05 A. by adding the following:

6. All backfill within the paved portion of the street right of way shall meet the requirements of the City of Marshalltown Standard Specifications for Street Excavation and Restoration

SS-2 PVC Pipe

Delete Section 5010 Paragraph 2.01 A. 1. in its entirety and replace with the following in its place

1. **Minimum Wall Thickness:**
 - a. **4 inch through 12 inch sizes:** DR14
 - b. **Sizes over 12 inch:** As specified in the contract documents.

SS-3 Pipe Coupling

Add the following to Section 5010 Paragraph 2.03 D. after the words pipe coupling: "Comply with AWWA C219"

SS-4 Center Sleeve

Delete Section 5010 Paragraph 2.03 D. 1. in its entirety and replace with the following:

1. **Center Sleeve (Center Ring):**
 - a. Ductile iron complying with ASTM A536 for sizes 4 inch through 16 inch.
 - b. Sizes over 16 inch: As specified in the contract documents.

SS-5 Polyethylene Wrap

Add the following to Section 5010 Paragraph 2.05 A. after the words Polyethylene Wrap

"Polyethylene wrap will only be required if it is noted on the detailed plan sheets."

SS-6 Tracer Wire Station

Delete Section 5010 Paragraph 2.05 B. 5. in its entirety and replace with the following:

5. **Tracer Wire Termination:** Comply with Marshalltown Water Works Figure #9 for the proper termination of tracer wire at fire hydrants.

SS-7 ADDITIONAL REQUIREMENT FOR PVC PIPE INSTALLATION

Add the following to Section 5010 Paragraph 3.03:

- C. The use of butterfly valves on DR14 pipe requires the inside diameter of the pipe to be chamfered in order to provide clearance for the valve disc. Refer to the valve manufacturer's instruction manual for the chamfer details.

SS-8 POLYETHYLENE ENCASEMENT

Delete Section 5010 Paragraph 3.05 in its entirety.

SS-9 TRACER SYSTEM INSTALLATION

Section 5010 Paragraph 3.06 F.: Delete the words "(comply with Figure 5010.102)" and replace with the following words: "(comply with Marshalltown Water Works Figure #9)"

SS-10 Gate Valves

Delete the following words from Section 5020 Paragraph 2.01 B. "or AWWA C515 (ductile iron)"

SS-11 Butterfly Valves

Delete Section 5020 Paragraph 2.01 C. 4. in its entirety.

SS-12 Tapping Valve Assemblies

Delete the following words from Section 5020 Paragraph 2.01 D. 1. "or AWWA C515"

SS-13 FIRE HYDRANT ASSEMBLY

Section 5020 Paragraph 2.02: Add the following:

H. Fire Hydrants shall meet the requirements of the Marshalltown Water Works

SS-14 Valve Stem Extension:

Delete Section 5020 Paragraph 2.03 C. in its entirety.

SS-15 FIRE HYDRANT

Delete the following words from Section 5020 Paragraph 3.03 A. "Figure 5020.201" and replace with the following words "Marshalltown Water Works Figure #9"

STANDARD DETAILS

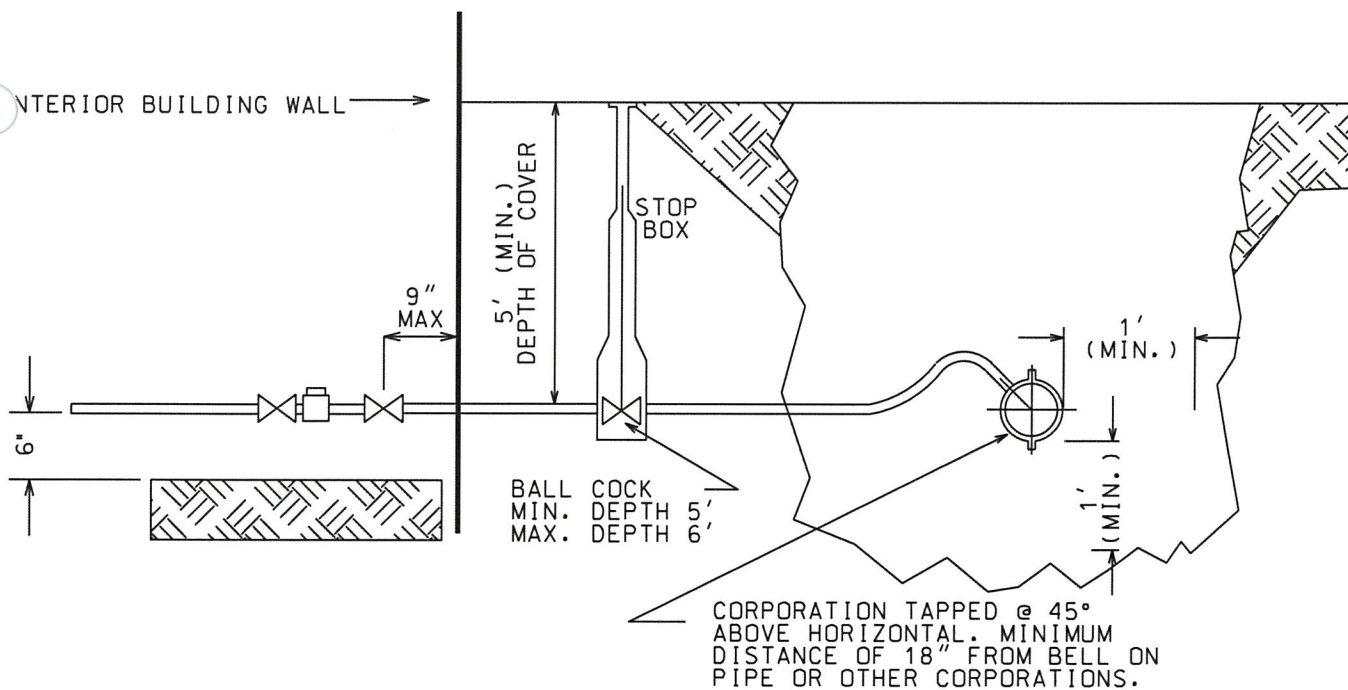
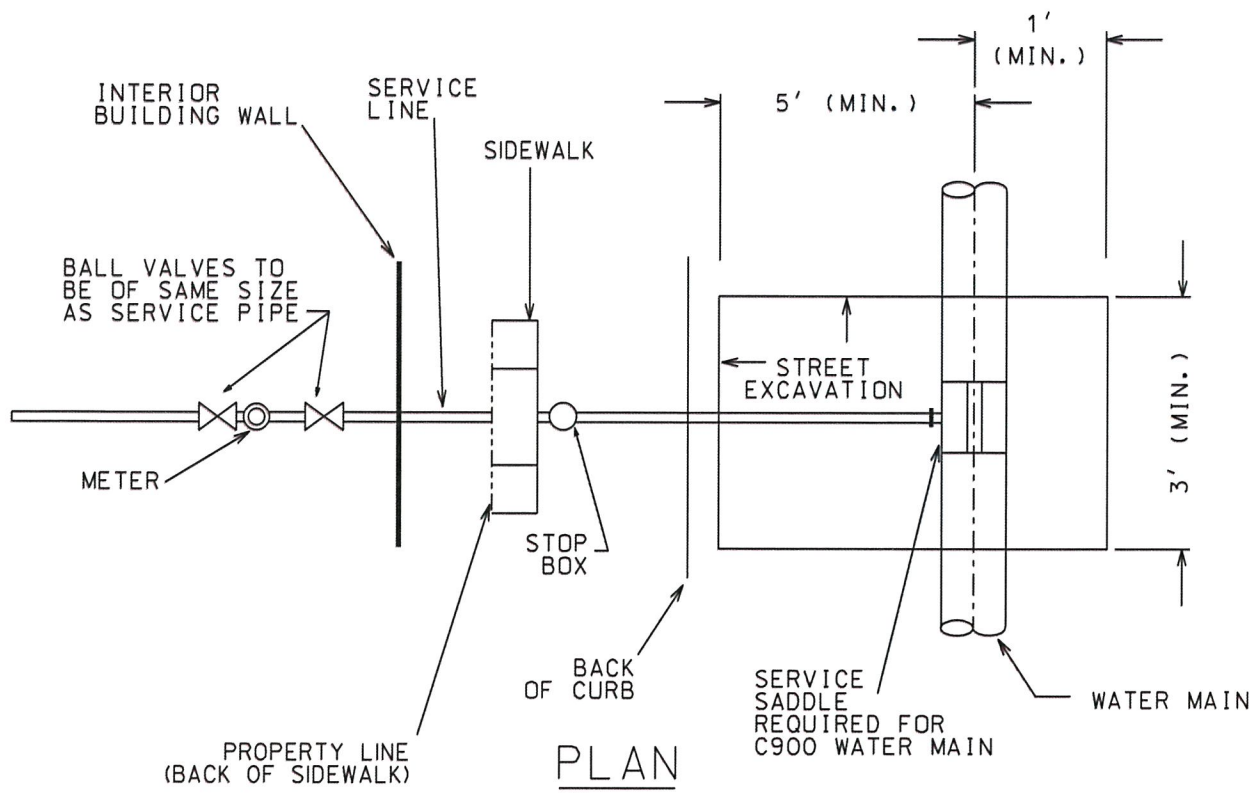


FIGURE #1
DETAIL OF $\frac{3}{4}$ " - 1"
SERVICE INSTALLATION

REVISED
11-18-96
PAGE 35

INTERIOR BUILDING WALL

VALVES TO BE
OF SAME SIZE
AS SERVICE PIPE

METER

EXTERNAL OR
INTERNAL STRAINER
(REQUIRED FOR 1½" LINES
AND LARGER)

SERVICE LINE

STOP BOX

PROPERTY LINE

STREET EXCAVATION

5' (MIN.)

SERVICE
SADDLE

1'

4' (MIN.)

WATER MAIN

PLAN

INTERIOR BUILDING WALL

3' MAX

6"

MIN DEPTH OR COVER
5'-0"

STOP BOX

BALL COCK
MIN. DEPTH 5'-0"
MAX. DEPTH 6'-0"

MIN 12"

MIN 12"

CORPORATION TAPPED
HORIZONTAL. MIN. DISTANCE
OF 2' FROM BELL ON PIPE OR
OTHER CORPORATIONS.

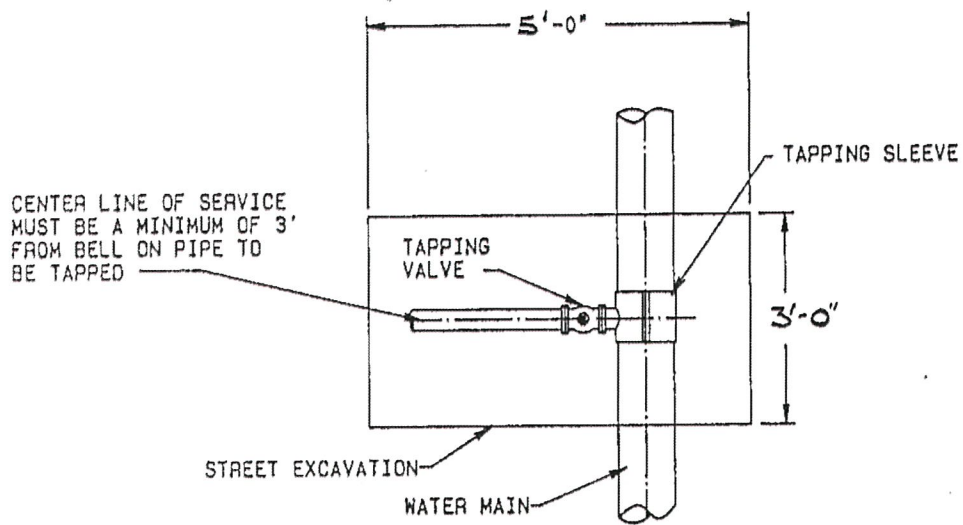
SECTION



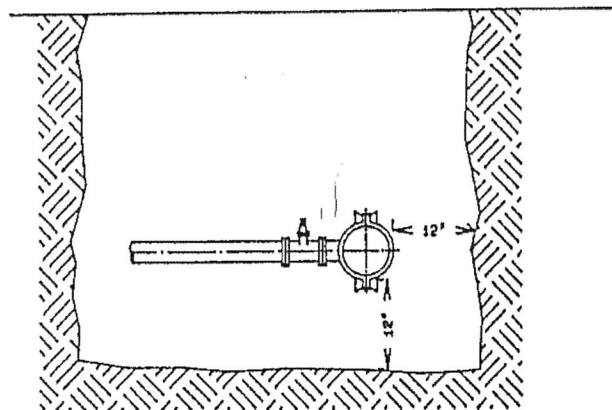
FIGURE #3
DETAIL OF 1" - 2"
SERVICE INSTALLATION

REVISED 7-2-96

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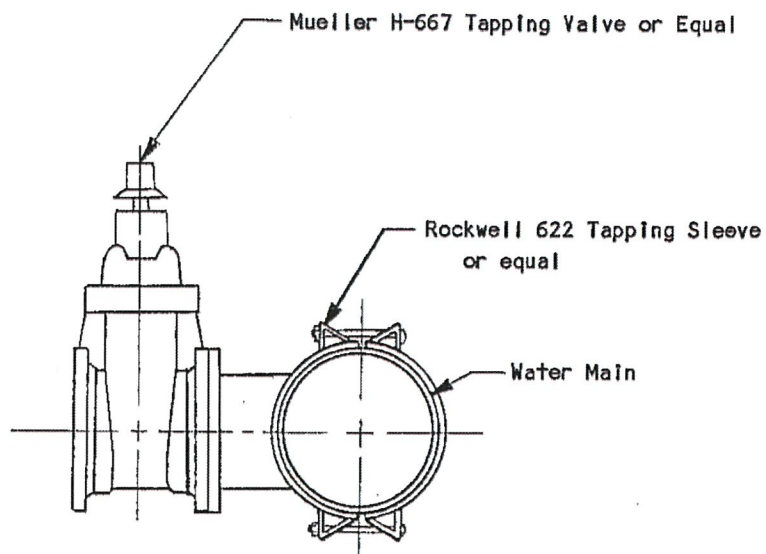
PLAN



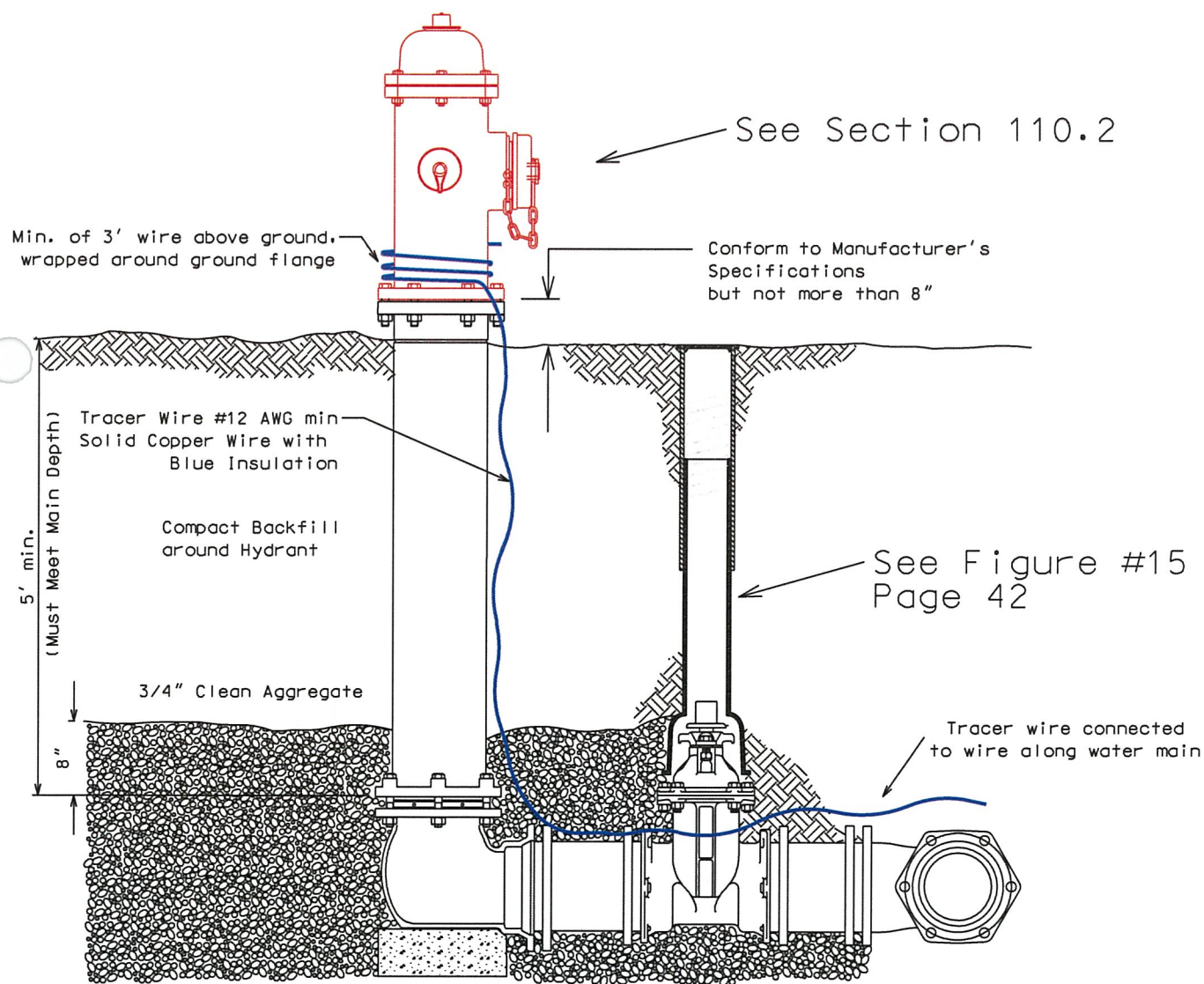
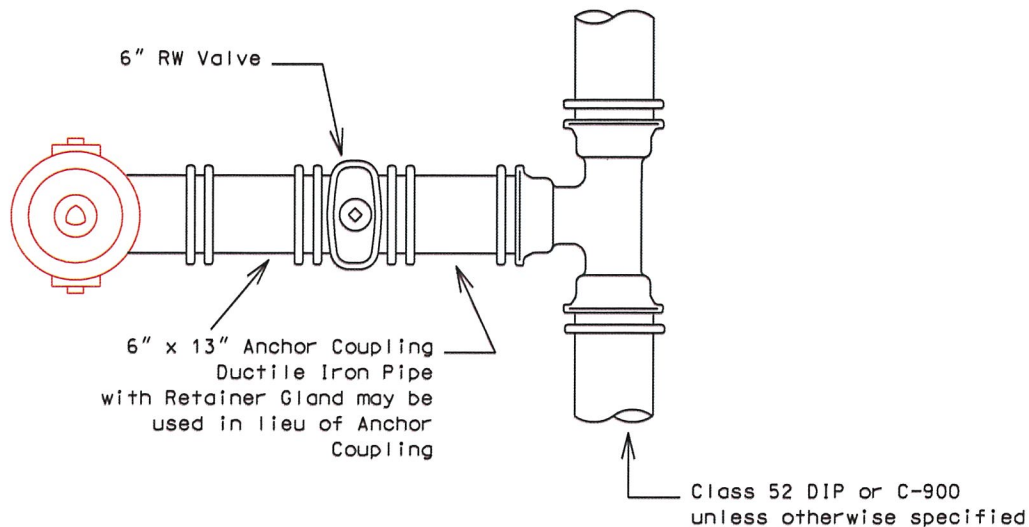
SECTION

FIGURE #4

EXCAVATION DETAIL FOR TAPPING
SERVICES LARGER THAN 2"



All taps in excess of 2" will be performed
by utility and billed to contractor.
Contractor will furnish all materials.



Provide concrete base and maintain hydrant drain openings

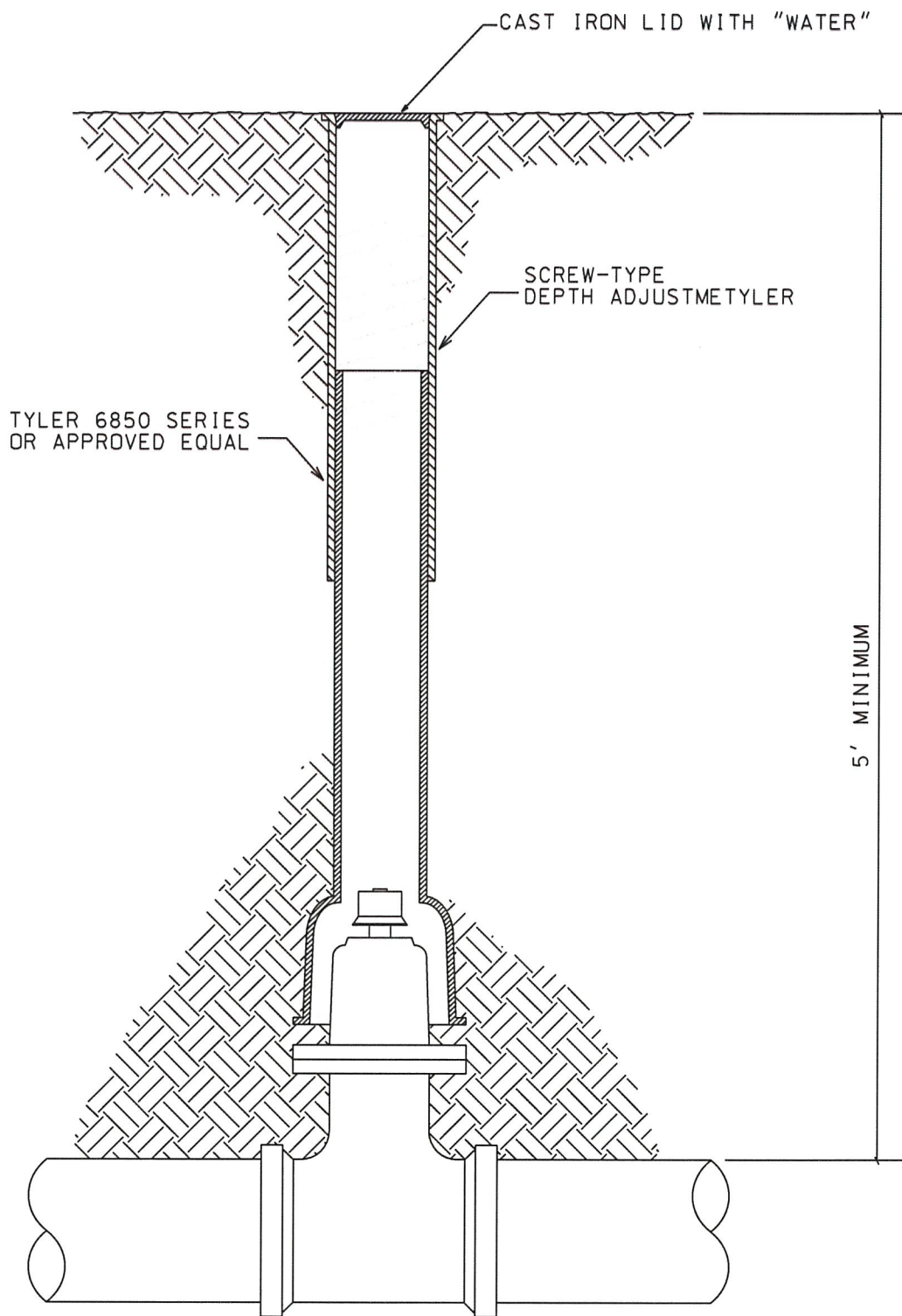
Figure #9

Detail of Standard
Hydrant Installation

Revised
4-21-2003

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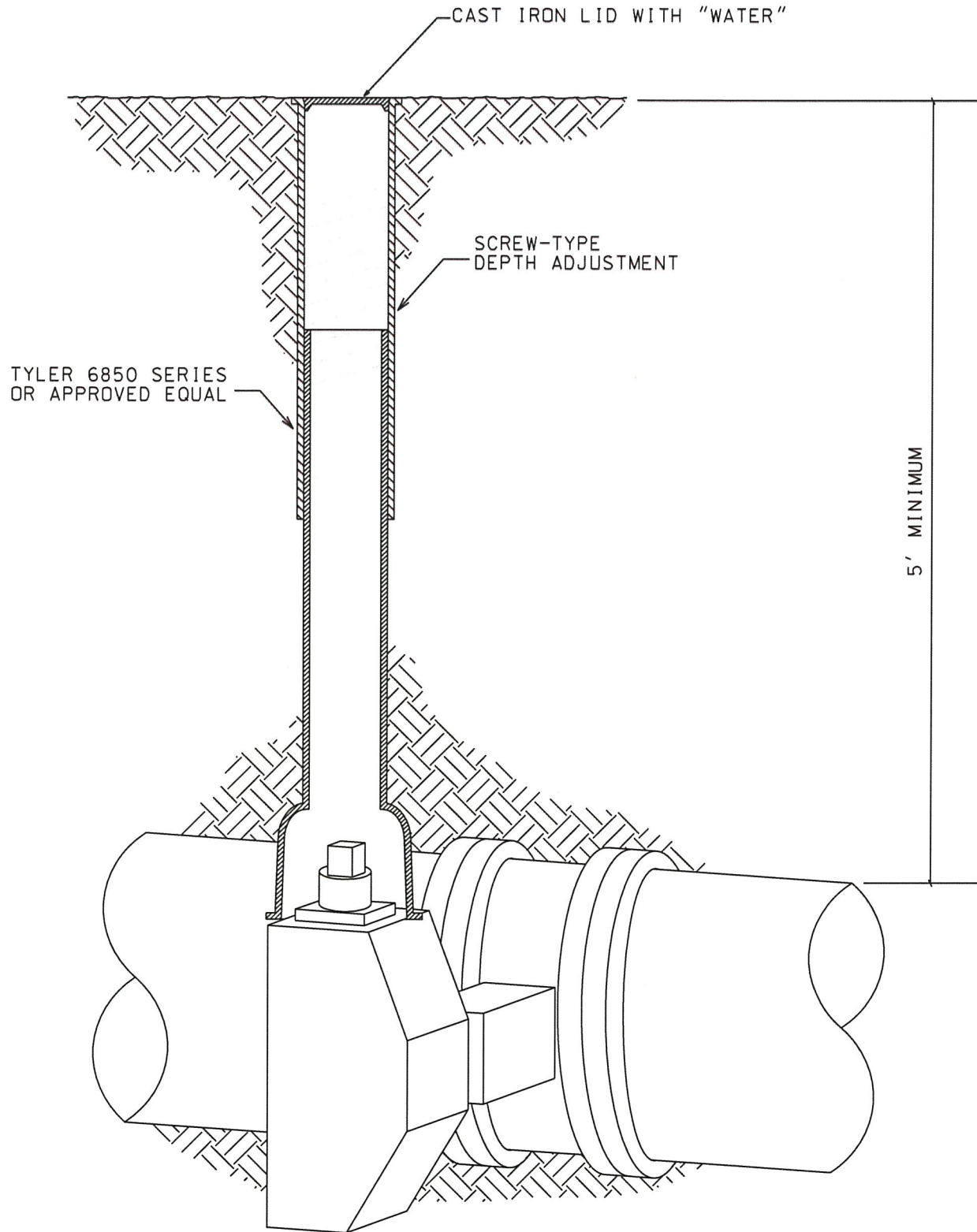


FIGURE # 16
DETAIL OF STANDARD
VALVE BOX INSTALLATION
FOR BUTTERFLY VALVES

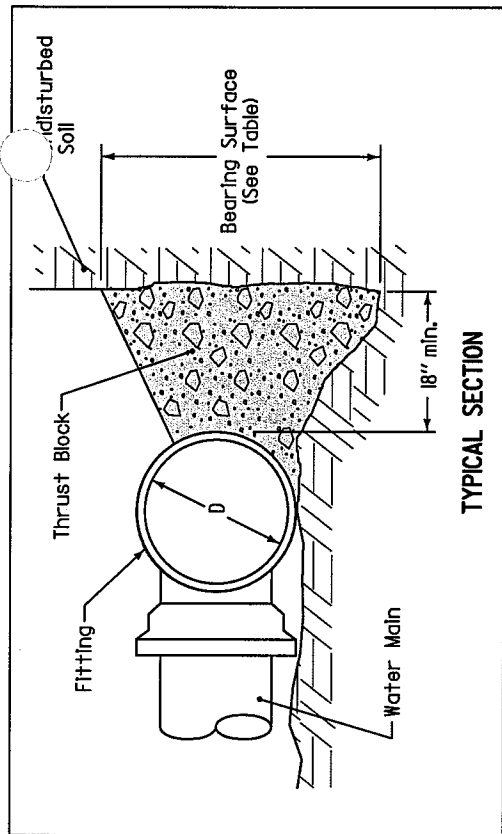
5-19-97

PAGE 50

Extend thrust blocks to undisturbed soil. Excavation into trench wall may be necessary.

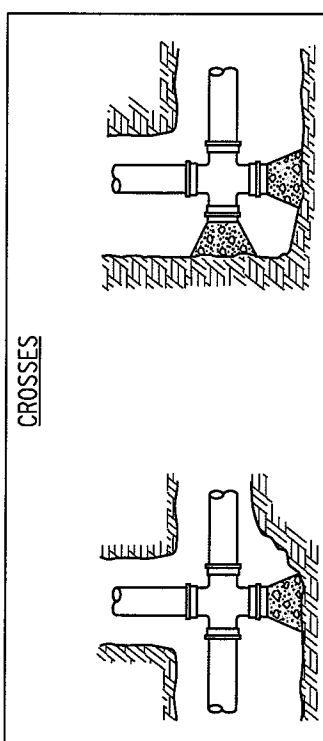
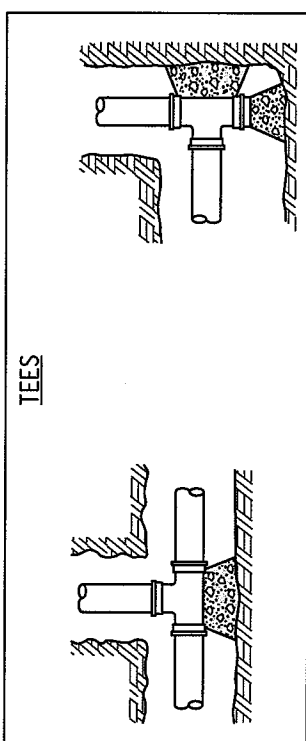
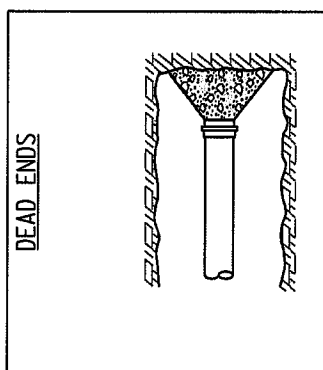
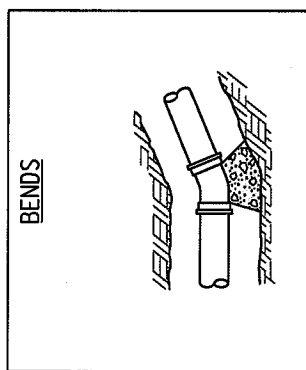
Form vertical surfaces of poured concrete thrust blocks except on bearing surface.

Encase all fittings in polyethylene wrap. Do not allow concrete to directly contact joints or fitting bolts.



Diameter of Pipe, D (inches)	MINIMUM BEARING SURFACE (sf)					Tees and Dead Ends
	Bends					
	11¼°	22½°	45°	90°		
4	1	1	2	4	3	
6	1	2	4	8	6	
8	2	4	7	14	10	
10	3	6	11	21	15	
12	4	8	16	29	21	
14	5	11	21	39	28	
16	7	14	27	50	36	
18	9	17	34	63	45	
20	11	21	42	78	55	
24	15	31	60	111	78	
30	24	47	92	171	120	
36	34	67	132	244	173	

Minimum surface area based on water pressure of 150 psi and allowable soil pressure of 1,000 psf.

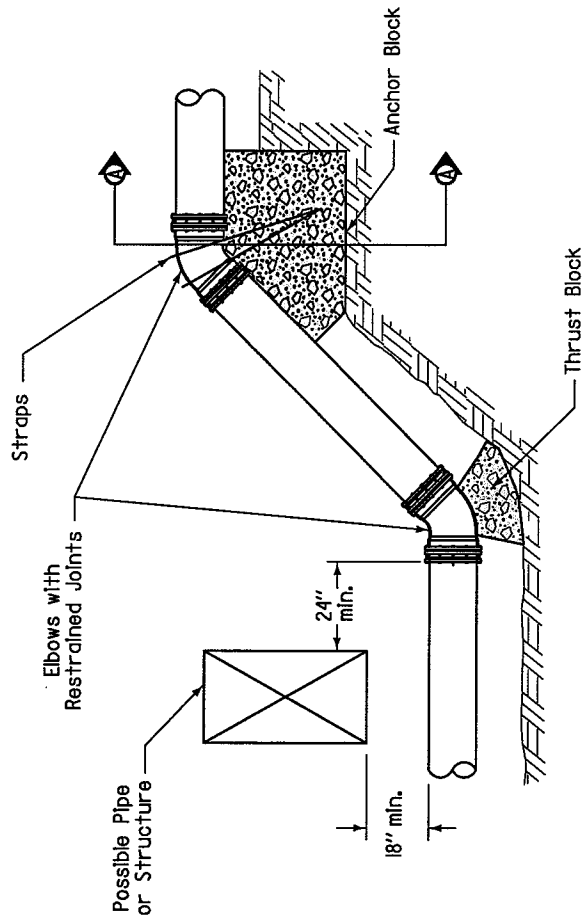


TYPICAL PLAN

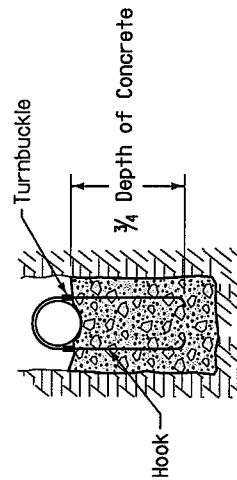
SUDAS	Iowa Department of Transportation	DESIGN
		NEW 04-21-09
FIGURE 5010.101		WM-101
REVISIONS: New. Replaces SUDAS Figure 5010.1		SHEET 1 of 2
SUDAS DIRECTOR		DESIGN ENGINEER
SUDAS DIRECTOR		DESIGN ENGINEER

THRUST BLOCKS

CHANGES IN PIPE DEPTH



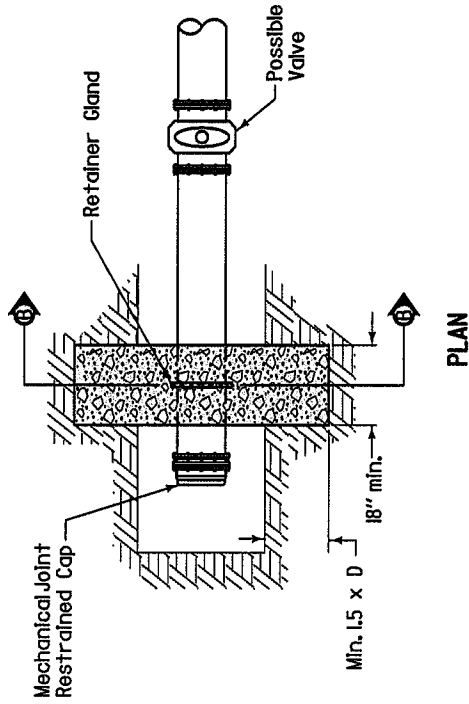
ELEVATION



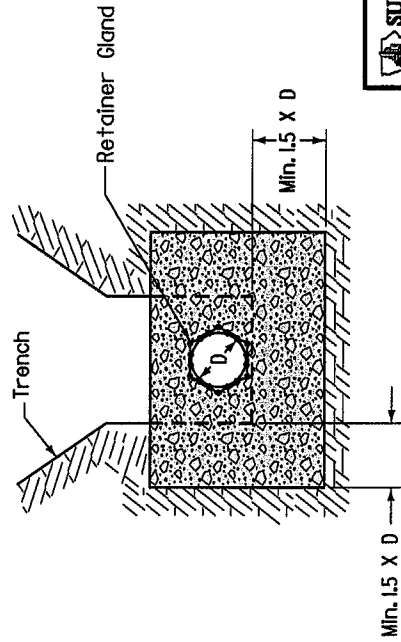
SECTION A-A

DEAD ENDS (ALTERNATE METHOD)

Use only when allowed by the Engineer, or when specified in the contract documents.



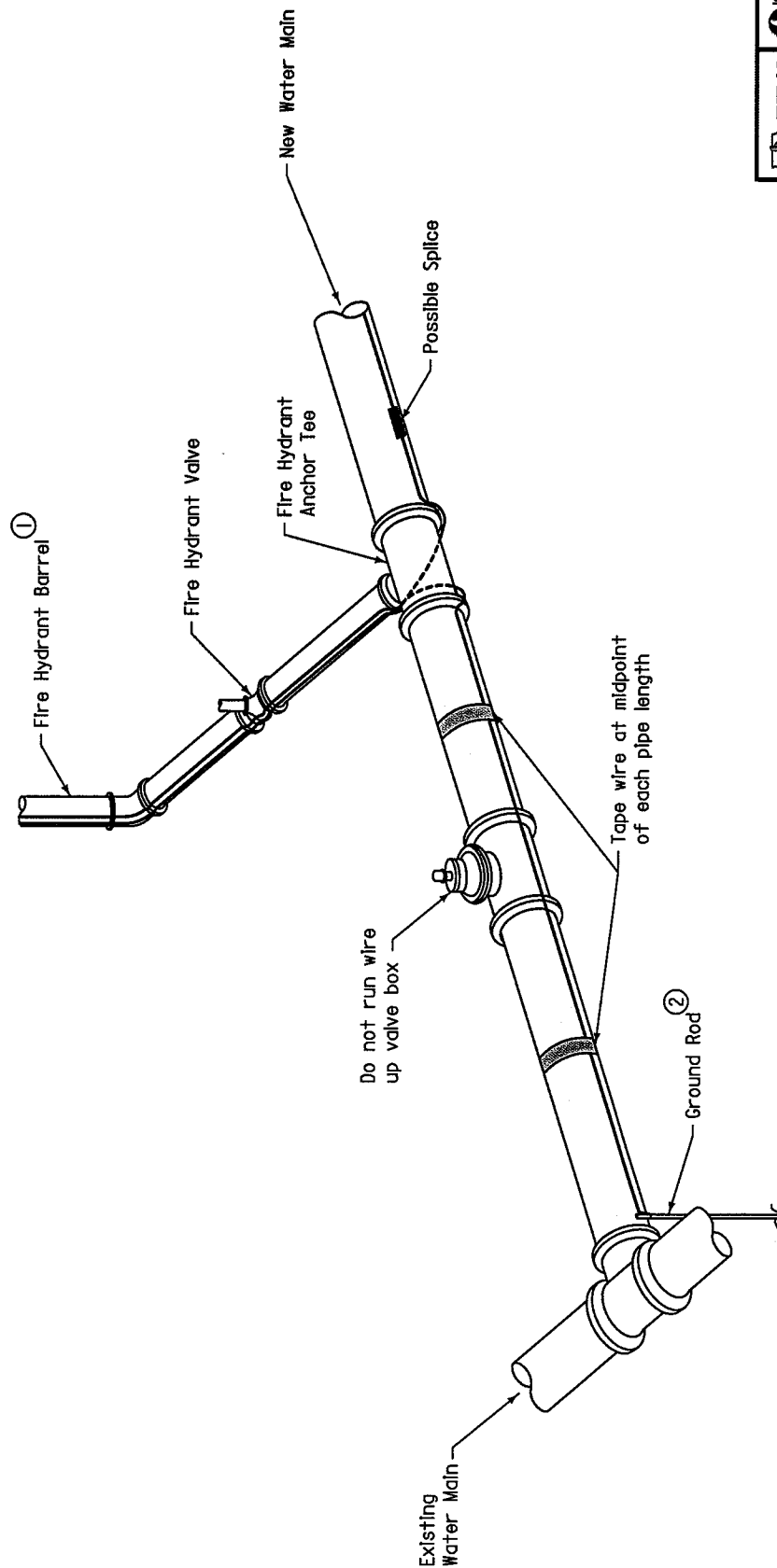
PLAN



SECTION B-B

SUDAS	Iowa Department of Transportation	DESIGN
FIGURE 5010.101	STANDARD ROAD PLAN	NEW 04-21-09
REVISIONS: New. Replaces SUDAS Figure 5010.1.	WM-101	SHEET 2 of 2
DESIGNED BY: Deanna M. Smith	SUDAS DIRECTOR	DESIGN METHOD: ENGINEER
THRUST BLOCKS		

- ① Extend tracer wire up fire hydrant barrel to internal terminals of tracer wire station and back down. Refer to WM-201 for details of fire hydrant assembly.
- ② Clamp tracer wire to ground rod at system termination points.



TYPICAL INSTALLATION

SUDAS	Iowa Department of Transportation	NEW 04-21-09
FIGURE 5010.102	STANDARD ROAD PLAN	WM-102
REVISIONS: New. Replaces SUDAS Figure 5010.3	SHEET 1 of 1	
SUDAS DIRECTOR	Deanne McPhail	DESIGN METHOD ENGINEER
TRACER SYSTEM		



December 21, 2022

Project No: 222087MSM

Bolton and Menk, Inc.
1519 Baltimore Drive
Ames, Iowa 50010

Re: **Geotechnical Investigation Executive Summary**
Main Street Reconstruction
Marshalltown, Iowa

Dear Mr. Greg Broussard, P.E.:

Thank you for the opportunity to provide our services for the above referenced project. Upon completion of the geotechnical drilling and analysis, the following summary of the findings can be concluded from the data.

- The site consists of mainly existing fill and loess soil deposits, classified as CL soils. The natural, on-site soils are not expansive by nature. These types of soils are easily compacted and suitable for all types of fill applications. Proctor values of the virgin material from the borings have not been established. It is likely these virgin soils will be intermixed with other fill materials, therefore it is recommended the Proctor values be established at the time of construction.
- No groundwater was noted during drilling operations. Dewatering techniques may become necessary during construction as these levels will fluctuate with seasonal changes.
- Existing fill soils were encountered to a depth of 8 feet below existing grade in Boring Nos. 9 through 11. The fill was fairly homogeneous, in a moist condition. If the owner does not want to assume the risk of unforeseen settlements, the fill soils should be completely removed and replaced in a controlled manner. This would be the most conservative approach.
- Some of the on-site soils are very sensitive to moisture content fluctuations, i.e. the fill sands noted in some of the bores. This could create low bearing or difficult compaction scenarios. It may be necessary to re-work (farm) or chemically stabilize the soils to adjust the moisture contents to an acceptable range for compaction.
- Based on current soil characteristics, the owner may elect to chemically stabilize the soil subgrades with a low dose to build strength in the loess soils. This dosage could be less than 3%, and would enhance the soil subgrade strength to allow for a longer pavement life prior to rehabilitation efforts. This is especially beneficial if several utility lines are installed during the reconstruction of the street, which creates areas of potential differential settlements.
- Pavements can be supported on the natural soils, which should be scarified and recompacted to support the desired pavement sections. The pavement sections could also be supported on granular subbase for additional drainage enhancements. It is recommended to utilize a 7 inch pavement section for the project.

Please feel free to call should you have questions or if I may be of further assistance.

Sincerely,

A handwritten signature in blue ink, appearing to read "Sybil K. Ferrier".

Sybil K. Ferrier, P.E.
Principal Engineer



GEOTECHNICAL INVESTIGATION

FOR

MAIN STREET RECONSTRUCTION

MARSHALLTOWN, IOWA

Project No: 222087MSM

Performed For:

Bolton & Menk, Inc.
Attn: Mr. Greg Broussard, P.E.
1519 Baltimore Drive
Ames, Iowa 50010

Conducted By:

Construction Materials Testing, Inc.
1610 E. Madison Ave
Des Moines, IA 50313

December 21, 2022

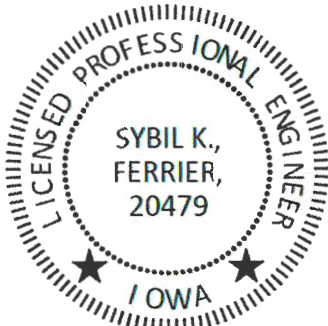
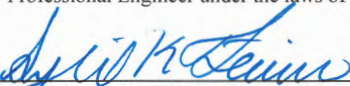
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.	
	 Sybil K. Ferrier, P.E. License No. 20479	<u>12-21-22</u> Date
My License renewal date is <u>December 31, 2024</u> .		
Pages or sheets covered by this seal: <u>All Pages</u> .		



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GEOTECHNICAL ENGINEERING REPORT

Main Street Reconstruction

Marshalltown, Iowa

Project No: 222087MSM

December 21, 2022

PROJECT BACKGROUND

Bolton and Menk is assisting the City of Marshalltown with the reconstruction of Main Street, between South Center Street and South 3rd Avenue. The reconstruction is approximately 3 blocks in length, with intersections improvements north and south of Main Street along the same corridor. It will require the construction of new streets, updating utilities, and landscaping. It is anticipated that minor site grading on the order of 2 feet or less will be required to achieve the desired final grades. Thirteen borings were conducted along the street alignment to evaluate soil conditions. The purposes of this report are to describe the subsurface conditions encountered in the borings, analyze and evaluate the test data, and provide geotechnical recommendations regarding the design and reconstruction of the street.

FIELD EXPLORATION

Field exploration was conducted on December 7, 2022. The boring locations were selected and staked in the field by Bolton & Menk, Inc. No topographic site information was available at the time of this report. Individual Boring Logs and a Site Plan are included in the attachments of this report showing the findings and locations of the borings.

The borings were drilled with a truck-mounted drill rig using continuous flight augers to advance the boreholes. Representative samples were obtained at various intervals using augers and split spoon samplers in general accordance with ASTM procedures. Field logs of each boring were recorded by the drill crew during drilling operations. These logs contain visual classifications of the materials encountered as well as the driller's interpretation of the subsurface conditions between samples during drilling. Soil samples were sealed and returned to the laboratory for further testing and classification. The final Boring Logs (see attached) represent an interpretation of the field logs and include modifications based on laboratory observations and test results for the samples.



SITE AND SUBSURFACE CONDITIONS

Site Geology

The site is located near downtown Marshalltown, and this geologic region of Iowa is known as the Des Moines Glacial Lobe. After the last glacier advanced through Iowa, it left behind a poorly drained landscape consisting of pebbly deposits striated with sand and gravel seams from glacial meltwater streams. Many of the natural soils present consist of Wisconsinan glacial till, loess and Pre-Illinoian glacial till underlain by the Pennsylvanian bedrock system. Wisconsinan glacial till typically consists of a lower sand content glacial till, generally mixed with sand seams and layers. The upper more weathered portion of the Pre-Illinoian glacial till, referred to as paleosol, is typically a higher clay content soil.

Soil Conditions

Specific subsurface soil conditions at each boring location are presented on the individual Boring Logs, enclosed in the appendix. The stratification boundaries shown on the Boring Logs represented the approximate boundary lines where changes in soil formations may occur. In-situ the transition between materials is more gradual than what is presented on the Boring Logs. Based on the borings, the subsurface conditions can be generalized as follows:

Pavement Section – The pavement section along this street was generally comprised of HMA pavements, with some brick sections below. The pavement sections were measured to be approximately 8 inches in thickness. Boring No. 3 (near N. 2nd Ave. intersection) noted foreign debris similar to trolley tracks beneath the pavement section. A piece of metal was recovered during coring operations. Brick sections were noted beneath Boring Nos. 9 through 13. Beneath the pavement, granular subbase comprised of approximately 4 inches of limestone and fill sand backfill were noted. The limestone sections were generally noted under Boring Nos. 1 through Boring No. 8, while the sand subbase was noted under Boring Nos. 9 through 13. The granular subbase was noted to be in a dry condition at the time of drilling. Core photos were not obtained due to poor recovery during core drilling operations.

Existing Fill – Existing fill soil was encountered to a depth of 8 feet below the pavement section in Boring Nos. 9 through 11. The fill was generally comprised of dark brown and dark yellowish brown sandy lean clays (CL). A sand seam was noted in Boring No. 9 near a depth of 3 feet below existing grade. This soil was present in a moist condition, and exhibited medium stiff consistencies.

Loess – Loess soils were the predominate soil encountered across this site. The loess was comprised of various shades of gray-brown, brown, rusty-gray-brown silty lean clays (CL). This soil was present in a moist to wet condition and exhibited soft to stiff consistencies. Mottling of the soil was noted after depths of 6 to 10 feet below existing grades in some of the bores. All borings terminated in this soil stratum near a depth of 15 feet below existing grade, with the exception of Boring Nos. 12. This boring terminated at a depth of 10 feet below existing grade.



Groundwater Observations

No groundwater accumulation or moisture seepage was noted during drilling operations. The borings were dry during and after drilling operations. It should be anticipated that groundwater levels will likely fluctuate between drilling and construction operations, which means dewatering techniques may become necessary. Sand seams and layers were also present in some of the bores, which can readily trap and channel groundwater.

Brown-gray coloring of the soil is another indication of potential groundwater levels. Fluctuations in groundwater can occur from varying amounts of precipitation, changes in surface coverage (i.e. adding pavements or vegetation), irrigation practices, etc. These short term observations are not necessarily an accurate indication of normal groundwater levels. Long-term observations would be required to better define the natural groundwater level in this area.

PROCEDURES

Laboratory Testing

The soil samples were classified in the laboratory based on visual observations, moisture content and strength tests. The soil descriptions and group symbols presented on the Boring Logs for native soils are in general accordance with the Unified Soil Classification System (USCS). The results of the laboratory tests are shown on the boring logs attached to this report.

ENGINEERING ANALYSIS AND RECOMMENDATIONS

Existing Fill Soils

Existing fill soils were encountered in Boring Nos. 9 through 11, beneath the granular surfacing. The fill soil was fairly homogeneous, and was comprised of a lean clay (CL). It is presumed this soil was placed during the past construction of these streets and infrastructure. Undocumented fill soils can cause differential settlements if not properly addressed. CMT has not been provided with any records of fill placement or compaction records, therefore we cannot address more specific fill support characteristics. Based on final site grades being altered and the soils being removed to accommodate new infrastructure, the fill soils may have a minor impact on subgrade construction for the reconstruction. It is likely these fill soils will be reworked prior to paving operations. It will be dependent on final elevations to determine the best remediation option at the time of construction, to alleviate potential settlement concerns. It is likely settlement concerns will be alleviated by replacing the fill soils in a controlled manner according to the new project specifications.

If fill soils are encountered in other areas of the site, the following design considerations should be noted. When the fill soils are encountered during grading, the owner should elect the following options for remediation, after consultation with the civil and geotechnical engineer of record. If the owner does not want to assume the risk of unforeseen settlements, the fill soils should be completely removed and replaced in a controlled manner. This is the most conservative approach. If this is not feasible, a less conservative approach would be to remove and



replace the top 2 feet in a controlled manner. Pavements are typically easier to repair than utility lines and foundations, therefore, the owner may elect to build/replace exterior pavements on these soils and assume the risk. If sidewalk pavements experience settlements, this could create tripping hazards for pedestrian traffic. If the owner does not wish to assume the risk of pavement movements, the same over-excavation and backfill procedure should be implemented in these areas. CMT can review these options and provide further recommendations based on final grading plans.

Cohesive fill material should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D-698 (Standard Proctor Test) at a moisture content of -1 to +4 percent of optimum. No fill should be placed in lifts greater than one foot in thickness. All lifts should be verified with density and moisture content testing during placement. Do not place fill on frozen ground or if the fill contains frozen material.

Site Preparation

Site preparation should consist of the stripping of any loose material present near the surface, such as existing pavement sections. This could be on the order of 12 inches or less across the site to adequately remove the existing pavement sections, granular subbase, trolley tracks and brick sections. If encountered, any mature debris fields, contaminated soils, vegetation, roots, or other large areas of organic materials, should be removed from the construction area and properly backfilled prior to further grading or construction operations.

During the initial site exploration, the moisture contents of the natural soils were generally near to slightly above (+2-3%) the recommended moisture content for compaction. Adjustment of the moisture content may be necessary during grading operations to achieve the desired amount of compaction at the preferred moisture content. If the soils are wetter during grading operations and weather permitting, farming the soils is a very economical way to lower the moisture content of the soils. If farming is not a feasible option, chemical stabilization can be conducted with cement, fly ash or hydrated quick lime. Chemical stabilization options can be discussed further as construction progresses and site conditions warrant stabilization. If elected, dosage rates should be determined at the time of construction to adjust for current soil moisture contents and the chemical chosen for stabilization. Based on current site conditions, it is assumed that a minimum of 8% fly ash and 6% cement (based on dry soil weight) would be needed for stabilization.

Earthwork Considerations

The soil profile at this site consists of silty and sandy lean clays, which contain random zones of high sand content and/or sand seams. No expansive soils were encountered during this exploration. The on-site soils (existing fill and natural) are suitable for general grading applications. The fill soils can be reused, if properly moisture conditioned and placed in a controlled manner. The on-site soils can be excavated utilizing conventional equipment. Cohesive soils are best compacted utilizing a sheepsfoot or pneumatic type compactor. Granular soils are best compacted using a vibratory compactor. If areas of heavy organics are identified during construction, they should be removed and properly backfilled prior to further construction.



It is recommended for any additional fill or borrow material to consist of a non-expansive (CL) cohesive material, free of organics and rubble, or a granular material. The cohesive material (clays) should be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D-698 (Standard Proctor Test) at a moisture content of -1 to +4 percent of optimum. If utilizing a granular fill, the material should be compacted to a minimum of 98 percent of the material's maximum dry density at a moisture content of -3 to +3 percent of optimum, as determined by ASTM D-698. No fill should be placed in lifts greater than one foot in thickness. All fill materials, cohesive or granular, should be pre-approved prior to placement. It is recommended for CMT personnel to be on-site during construction to verify compaction or material suitability during the grading process. Do not place fill on frozen ground or if the fill contains frozen material.

The loess soils have a characteristically high silt content, giving them a natural affinity for a high moisture content and lack of cohesion. In addition, sand seams and sand layers were noted in some of the bores. These soil types will not support trenching operations if encountered. If areas of increased sand are encountered during construction, they could cave or collapse rapidly especially if water is flowing freely throughout the excavation. All excavations should be adequately sloped or braced for safety if it is necessary for personnel to enter excavations. Excavation side slopes should be constructed and maintained in accordance with all local, state and federal requirements, including OSHA 29 CFR, part 1926.

Exterior Pavement Support and Design Considerations

The on-site natural soils are suitable for pavement subgrade preparation when properly moisture conditioned. Pavement subgrades should be thoroughly scarified and re-compacted to a minimum depth of 12 inches in order to maintain as much uniformity as possible. By scarifying and re-compacting the soils, a more homogeneous subgrade can be constructed. This will help to reduce the potential for differential settlements to occur within the pavements, especially if transition points from clay to sand are present along the subgrade alignment. In addition, the subgrade preparation should be conducted to a minimum width of 2 feet beyond the edge of the pavements to eliminate the potential for curb and gutter settlements. If soil subgrades prove to be unsuitable during construction, chemically stabilizing the subgrade may be done with cement, fly ash or quick lime. If warranted, chemical dosage rates should be determined at the time of construction to adjust for current soil moisture contents and the chemical chosen for stabilization. Based on current soil characteristics, the owner may elect to chemically stabilize the soil subgrades with a low dose to build strength in the loess soils. This dosage could be less than 3%, and would enhance the soil subgrade strength to allow for a longer pavement life prior to rehabilitation efforts. This is especially beneficial if several utility lines are installed during the reconstruction of the street, which creates areas of potential differential settlements.

If a concrete pavement is utilized, the pavement can be designed for a modulus of subgrade reaction of 100 pounds per cubic inch or a minimum CBR value of 3 when placed on the prepared subgrade. If a hot mix asphalt pavement is utilized, the subgrade should be designed for a modulus of 2,000 pounds per square foot.

For the anticipated traffic loads in this site, CMT recommends a 7 inch thick PCC pavement consisting of 4,000 psi mix with a 6 percent entrained air content for a pavement section. If a HMA pavement is considered, CMT recommends a 1,000,000 ESAL mix for each lift. The lifts should consist of 4 inches of $\frac{3}{4}$ inch base mix, placed in two lifts, and 3 inches of $\frac{1}{2}$ inch surface mix. The pavement sections should be increased in thickness for



areas receiving higher traffic loads, such as near intersections, existing tie ins, or service vehicle approaches (trash enclosures), etc.

Pavement Drainage Considerations

Excess water from irrigation methods, rainfall events or general surface water runoff can infiltrate the pavement structure through cracks and joints. This type of water infiltration typically leads to premature pavement failures, seen as joint spalling, heaving of panels or pavement staining if not maintained appropriately. The fluctuations in groundwater levels can increase the risk for unwanted pavement faulting. Seasonal fluctuations have shown that perimeter drains, edge drains or a granular subbase can enhance the lifetime of the pavement structure.

Proper drainage will also aid in reducing the amount of differential settlement a pavement experiences. If this is a concern, one option would be to place a granular subbase under the pavements to aid in drainage. The granular subbase could consist of a one inch clean granular material, such as crushed limestone, D-57 stone or IDOT Modified Subbase and be placed a minimum of 6 inches in thickness. As an alternative, the onsite pavement sections can be recycled into a granular subbase and used as a drainage layer. If edge drains are desired, they could be installed behind the curb and gutter system and connected to storm drains. Edge drains consisting of 4 inch perforated PVC pipe would be adequate to maintain soil moisture contents. Drain tiles could also be considered to aid in removing excess water from under the pavements and should be surrounded by a free draining granular material. This will help in maintaining the groundwater table beneath the pavements and alleviate frost heave potentials. All drainlines should be constructed to drain to a suitable outlet, or daylighted out away from structures so as not to re-introduce water to those structures.

Pavement Frost Heave Considerations

Transition points in soil subgrades or soils that exhibit predominate textural changes (silts to clays, sands to clays, etc.) can react differently to frost heave movements, even when groundwater levels are uniform beneath the pavements. These transition areas may not be apparent from the ground surface, but could exist within the zone of influence beneath the pavements (within several feet bottom of the pavement structure). These transitions points can create faulting in the pavement sections, or non-uniform frost heave movements. It may not be possible to delineate these zones from boring information alone, however remedial measures can be taken to reduce the potential for these movements to occur. The soils at this site are comprised of predominately silty lean clays and sand seams. To alleviate the potential for frost heave, groundwater levels should be maintained as low as possible beneath pavements. Dewatering techniques, such as drainlines or subdrains, or utility trench bedding material, can be designed to divert water from beneath pavements. Proper utility line installation and curb backfill process can also improve frost heave potential.



GENERAL COMMENTS

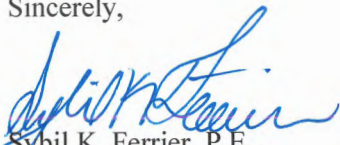
CMT should be retained for testing and observation during construction to help determine that the design recommendations are fulfilled.

The analysis and recommendations presented in this report are based upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations, which may occur between borings. If, during construction, the nature and extent of such variations appear evident; it will be necessary to reevaluate the recommendations of this report.

The scope of service for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied are intended or made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid, unless the changes are reviewed and the conclusions of this report are modified or verified in writing by the geotechnical engineer.

Sincerely,



Sybil K. Ferrier, P.E.
Principal Engineer



APPENDIX

GENERAL NOTES - BORING LOG DESCRIPTIONS

Soil descriptions stated on the Boring Logs are based on the Unified Soil Classification System as stated in ASTM Designations D-2487 and D-2488. The Unified Soil Classification group symbol listed in the table below correlate to the group symbols listed on the Boring Logs. The classification is mainly based on visual observations to define the soil characteristics. If a more detailed soil description is required, additional soil testing will be conducted to better define the soil characteristics.

Group Symbol	Group Name	Group Symbol	Group Name	Group Symbol	Group Name	Group Symbol	Group Name
SW	Well-graded Sand	GW	Well-graded Gravel	CL	Lean Clay	CH	Fat Clay
SP	Poorly-graded Sand	GP	Poorly-graded Gravel	ML	Silt	MH	Elastic Silt
SM	Silty Sand	GM	Silty Gravel	OL or OH	Organic Silt	Pt	Peat
SC	Clayey Sand	GC	Clayey Gravel		Organic Clay		

RELATIVE DENSITY OF COARSE-GRAINED SOILS		CONSISTENCY OF FINE-GRAINED SOILS		
SPT, bpf	Relative Density	Unconfined Compressive Strength, Q_u , psf	Consistency	SPT, bpf
0-3	Very Loose	< 500	Very Soft	0 – 2
4-9	Loose	500 - 1,000	Soft	2 – 4
10-29	Medium Dense	1,001 - 2,000	Medium Stiff	4 – 8
30-49	Dense	2,001 – 4,000	Stiff	8 – 15
50-80	Very Dense	4,001 – 8,000	Very Stiff	15 – 30
80+	Extremely Dense	8,001 – 16,000	Hard	30 – 100
		>16,000	Very Hard	>100

GRAIN SIZE TERMINOLOGY		RELATIVE PROPORTIONS		
Major Component of Sample	Size Range	Descriptive Terms(s) (of components also present in sample)	Fines Percent of Dry Weight	Sand and Gravel Percent of Dry Weight
Cobbles	12 in. to 3 in. (300 mm to 75 mm)	Trace	< 5	< 15
Gravel	3 in. to #4 sieve (75 mm to 4.75 mm)	With	5 – 12	15 – 29
Sand	#4 to #200 sieve (4.75 mm to 0.074 mm)	Modifier	> 12	> 30
Silt or Clay	Passing #200 sieve (> 0.074 mm)			

DRILLING AND SAMPLING ABBREVIATIONS

Drilling Methods

CFA – Continuous Flight Auger; typically, 4, 6, or 8 inches in diameter (ASTM D 1452)

HSA – Hollow Stem Auger; 6 or 8 inches in diameter, continuous flight auger remains in bore hole with undisturbed soil samples obtained from center of auger.

HA – Hand Auger; typically with a 4 inch or less diameter auger

Sample Types

SS - Split Spoon; samples obtained with a 140 lb manual hammer in accordance with ASTM D1586.

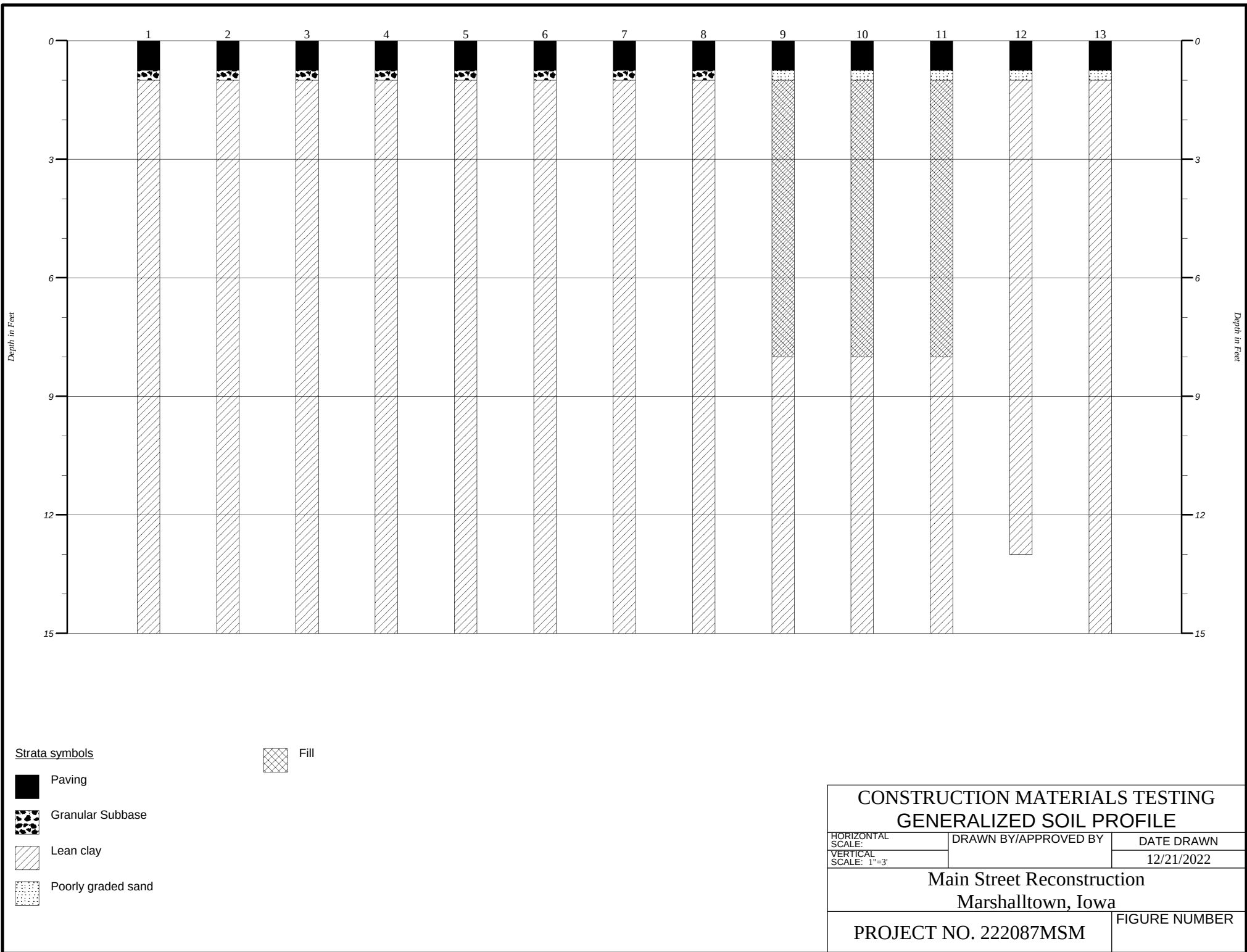
SSA – Split Spoon; samples obtained with a 140 lb automatic hammer in accordance with ASTM D 1586.

ST – Shelby Tube; thin walled tube samples, typically for cohesive soils, in accordance with ASTM D1587.

SPT- Standard Penetration Test: The number of blows required to drive a sampler, either split spoon or drive cone, into the soil with a 140 lb mass dropped a distance of 30 inches, in accordance with ASTM D 1586, and the number of blows are recorded in each 6 inch interval over a distance of 18 inches. Blow counts are reported for each 6 inch interval or the sum of the last two intervals is reported. The sum of the last two intervals is referred to as N, in blows per foot.

BS – Bulk Disturbed Sample

CPT – Cone Penetration Test; A device in which a 60° cone is pushed continuously into the soil and the cone end resistance is measured for skin friction and end bearing (ASTM D3441).





Project **Main Street Reconstruction**
Marshalltown, Iowa

Boring # **1**

Client **Bolton and Menk**

Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA		
								±4.0 inches Granular Subbase		
								Rusty gray brown silty lean clay, moist to very moist	CL	
3										
	1	CS		27.7		3,000**				
6								Brown after 6 ft.		
								LOESS		
								Sand seam noted near 8 ft.		
9	2	CS		29.5		500**				
12										
	3	CS		19.6		2,500**				
15								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		
18										



Project **Main Street Reconstruction**
Marshalltown, Iowa
Boring # **2**
Client **Bolton and Menk**
Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA		
								±4.0 inches Granular Subbase		
								Brown silty lean clay, moist to wet	CL	
3										
	1	CS		26.2		3,000**				
6										
								LOESS		
9										
	2	CS		29.5		1,500**				
12										
								Gray-brown after 12 ft.		
15										
	3	CS		33.5		500**				
18								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		



Project **Main Street Reconstruction
Marshalltown, Iowa**

Boring # **3**

Client **Bolton and Menk**

Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA, Trolley Track		
								±4.0 inches Granular Subbase		
								Brown silty lean clay, moist to very moist	CL	
3										
	1	CS		26.4		2,500**				
6										
								LOESS		
9										
	2	CS		28.6		2,000**				
								Gray-brown after 10 ft.		
12										
	3	CS		23.2		2,500**				
15										
								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		
18										



Project **Main Street Reconstruction**
Marshalltown, Iowa

Boring # **4**

Client **Bolton and Menk**

Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA		
								±4.0 inches Granular Subbase		
								Gray-rusty-brown silty lean clay, moist to wet	CL	
3										
	1	CS		27.0		2,000**				
6										
								LOESS		
9										
	2	CS		27.3		2,000**				
12										
15										
	3	CS		30.9		500**				
18										
								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		



Project **Main Street Reconstruction**
Marshalltown, Iowa
Boring # **5**
Client **Bolton and Menk**
Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA		
								±4.0 inches Granular Subbase		
								Gray-rusty-brown silty lean clay, moist to very moist	CL	
3										
	1	CS		28.4		1,500**				
6										
								LOESS		
9										
	2	CS		26.5		3,500**				
12										
15										
	3	CS		26.0		3,500**				
18										
								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		



Project **Main Street Reconstruction**
Marshalltown, Iowa

Boring # **6**

Client **Bolton and Menk**

Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA		
								±4.0 inches Granular Subbase		
								Gray-rusty-brown silty lean clay, moist	CL	
3										
	1	CS		27.7		2,500**				
6										
								LOESS		
9										
	2	CS		26.2		2,500**				
12										
15										
	3	CS		24.1		3,000**				
18										
								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		



CONSTRUCTION MATERIALS
TESTING

Project Main Street Reconstruction
Marshalltown, Iowa
Boring # 7
Client Bolton and Menk
Surface Elev. Existing Ground Surface

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA		
								±4.0 inches Granular Subbase		
								Brown-rusty silty lean clay, moist	CL	
3										
	1	CS		26.3		3,000**				
6										
								LOESS		
9										
	2	CS		25.6		3,500**				
12										
15										
	3	CS		25.7		3,500**				
18										
								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		



Project **Main Street Reconstruction**
Marshalltown, Iowa

Boring # **8**

Client **Bolton and Menk**

Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA		
								±4.0 inches Granular Subbase		
								Brown silty lean clay, moist	CL	
3										
	1	CS		26.1		2,500**				
6										
								LOESS		
9										
	2	CS		25.7		3,000**				
12										
15										
	3	CS		27.6		2,500**				
18										
								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		



Project **Main Street Reconstruction**
Marshalltown, Iowa
Boring # **9**
Client **Bolton and Menk**
Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA and Brick		
								±4.0 inches Fill Sand	SP	
								Dark brown sandy lean clay, moist	CL	
3								Sand seam noted near 3 ft.		
	1	CS		14.4		3,500**		EXISTING FILL		
6										
								Rusty-brown-gray silty lean clay, very moist to wet	CL	
9	2	CS		28.4		1,500**				
12								LOESS		
	3	CS		31.9		500**				
15								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		
18										



Project **Main Street Reconstruction**
Marshalltown, Iowa
Boring # **10**
Client **Bolton and Menk**
Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA and Brick		
								±4.0 inches Fill Sand	SP	
								Dark brown sandy lean clay, moist	CL	
3										
	1	CS		15.5		3,000**		EXISTING FILL		
6										
9	2	CS		28.7		1,000**		Rusty-brown-gray silty lean clay, moist to wet	CL	
12										
								LOESS		
15	3	CS		32.8		500**				
18								End of Boring No groundwater noted during drilling operations. **Estimated using calibrated penetrometer.		



Project **Main Street Reconstruction**
Marshalltown, Iowa
Boring # **11**
Client **Bolton and Menk**
Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA and Brick		
								±4.0 inches Fill Sand	SP	
								Dark yellowish brown sandy lean clay, moist	CL	
3										
	1	CS		24.4		3,000**		EXISTING FILL		
6										
								Light brown silty lean clay, moist	CL	
9	2	CS		25.9		2,500**				
12								LOESS		
	3	CS		21.3		4,000**				
15								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		
18										



Project **Main Street Reconstruction**
Marshalltown, Iowa

Boring # **12**

Client **Bolton and Menk**

Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA and Brick		
								±4.0 inches Fill Sand	SP	
								Light brown sandy lean clay, moist	CL	
3										
	1	CS		20.1		2,000**				
6										
								LOESS		
9										
	2	CS		26.2		2,000**		Sand seam noted near 9 ft.		
12								End of Boring		
								No groundwater noted during drilling operations.		
								**Estimated using calibrated penetrometer.		
15										
18										



Project **Main Street Reconstruction**
Marshalltown, Iowa

Boring # **13**

Client **Bolton and Menk**

Surface Elev. **Existing Ground Surface**

Depth Ft.	Sample #	Method	SPT bpf	Moisture %	Dry Density pcf	Unconfined Compressive Strength	Cross Section	Material Description *	USCS	Water Level
0								±8.0 inches HMA and Brick		
								±4.0 inches Fill Sand	SP	
								Light brown sandy lean clay, moist	CL	
3										
	1	CS		16.5		3,500**				
6										
								LOESS		
9										
	2	CS		23.4		2,500**				
12										
15										
	3	CS		26.7		2,500**				
18								End of Boring No groundwater noted during drilling operations. **Estimated using calibrated penetrometer.		

Marshalltown - Main Street



**RESOLUTION APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT
AND COST FOR THE SOUTH CENTER STREET MEDIAN REPLACEMENT
PROJECT, IN THE CITY OF MARSHALLTOWN, IOWA, BEING PROJECT NO.
STR25-002**

WHEREAS, there was placed on file in the office of the Clerk of the City of Marshalltown, Iowa, proposed plans and specifications, proposed form of contract and estimated cost for a public improvement in the City of Marshalltown, Iowa, for the South Center Street Median Replacement, Project No. STR25-002, as fully set forth in the resolution ordering same, and that public notice of hearing on such plans, specifications and form of contract were duly published in the Marshalltown Times-Republican in time for hearing now before the Council, and

WHEREAS, written objections to the plans, specifications and form of contract have been called for and no such written objections have been filed with the City Clerk, and oral objections being called for and no oral objections being made in open Council, it is the decision of this Council that such plans, specifications, form of contract and estimate of cost should be approved.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the plans, specifications, form of contract and estimated cost heretofore placed on file and upon which public notice has been duly given and no objections thereto have been made either in writing or in open council, the Council does now adopt and approve the plans, specifications, form of contract and estimate of cost for Project No STR25-002, being the South Center Street Median Replacement Project in the City of Marshalltown, Iowa.

Passed this 24th day of February 2025, and signed this _____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor Greer and City Council
FROM: Heather Thomas, Public Works Director
DATE: February 10, 2025
RE: S Center Street Median Replacement Project (STR 25-002) _Approval following Public Hearing

Strategic Plan:

- ☒ Strategy 1: Expand and improve development in the community.
- ☐ Strategy 2: Enhance Marshalltown's public image.
- ☒ Strategy 3: Continually improve and sustain the City's infrastructure, organization, and services.
- ☐ Strategy 4: Partner with citizens, for-profit, non-profit, and others to improve quality of life.

Plan Objective:

Plan for and construct new infrastructure; Plan and fund improvements to the City's infrastructure and buildings.

Recommendation:

Staff recommends approving plans, specifications, form of contract, and opinion of probable cost for said improvements following the public hearing.

Budget Impact:

The opinion of probable construction costs is \$100,000. We also recommend budgeting for a 10% construction contingency on this project, or an additional \$10,000. This project is to be funded through bond funds set aside for the Street Improvement Program, which based on timing will likely come from the 2021 GO Bond (Fund 363). Sufficient funds are available for this project.

Description/Background:

Several years ago, the city partnered with Iowa DOT on a project for Highway 14, from the Anson Street intersection, south. As part of that project, the center medians were reconstructed with some having planting areas and some having a colored stamped concrete. The center median just north of the Anson Street intersection is not part of the State Highway 14 route so it was not redone, is deteriorating, and needs to be reconstructed. In order to maintain consistency, we are proposing to replace with the interior of the median to match the colored stamped concrete. There are additional medians along Anson Street; however, those are on Highway 14. We continue to be told by Iowa DOT that there is a project planned for Highway 14, north of where the last project stopped between 2026 -2028 so it is in our best interest to wait until that project scope and timeline becomes clearer to address other medians in the area.

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff, Mark Mitchell,
Greg Nichols, Jeff Schneider, Gary Thompson



In order to be able to maintain traffic during construction and at the request of the Street Superintendent, the triangular median in the vicinity for Hy-Vee traffic turning right from NB Center St lanes will be removed and not reinstalled.

Design services for this project were completed in-house in the Engineering Division of Public Works. We are also proposing to handle Construction Phase Services in-house.

We proposed calendar dates for completion with substantial completion on or before July 25, 2025 and full completion on or before August 29, 2025. Liquidated damages have been set at \$500 / calendar day.

The bid timeline is as follows:

- Ordering construction at the February 10th, 2025 council meeting
- Public Hearing at the February 24th, 2025 council meeting
- Receiving/Opening Bids at 10:30 AM, Tuesday, March 4th, 2025 @ City Hall
- Awarding Bid at the March 10th, 2025 council meeting.

Attachments: Official Notice of Hearing & Letting, Plans, Project Manual, Opinion of Probable Cost

i:\public works\council items\2025\s center median-hyvee\memo_str25002_center st median order construction.docx

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff, Mark Mitchell,
Greg Nichols, Jeff Schneider, Gary Thompson



OFFICIAL NOTICE OF HEARING AND LETTING

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

PROJECT NO. STR 25-002

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, PROPOSED FORM OF CONTRACT AND OPINION OF PROBABLE COST FOR THE SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT IN THE CITY OF MARSHALLTOWN, IOWA, AND THE TAKING OF BIDS FOR SUCH IMPROVEMENTS.

A public hearing will be held at 5:30 p.m. local time on the 24th day of February, 2025 in the Council Chambers, Second Floor, 10 West State Street, Marshalltown, Iowa, on the proposed plans, specifications, proposed form of contract, and the opinion of probable cost of improvements proposed to be constructed under PROJECT NO. STR 25-002, the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT, which is now on file in the office of the City Clerk and at said hearing any interested person may appear and file objection thereto or to the bidding process.

Sealed proposals based upon the proposed plans, specifications, proposed form of contract, opinion of probable costs of improvement, will be received at the City Clerk's Office located at 24 N. Center Street, Marshalltown, IA until 10:30 a.m. local time, on the 4th day of March, 2025 for the construction of the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT as described in the plans and specifications for Project No. STR 25-002, and which will be opened, read, and tabulated by the City Engineer or her designate at that time, will be acted upon by the City Council of said City at a meeting to be held in the Council Chambers on the 10th day of March, 2025 or at such later time and place as may then be fixed.

The proposed work will involve furnishing the labor, equipment, and materials necessary for constructing the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT in Marshalltown, Iowa as shown in the plans and specifications for PROJECT NO. STR 25-002, the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT.

The estimated quantities of materials and labor to be furnished in the construction of said improvements and on which bids will be received are as follows:

Removal of pavement; construction of a full depth PCC patch; construction of curb and gutter; construction of a stamped integral color median, traffic control, and miscellaneous work associated with reconstruction of a median.

All work is to be done in strict compliance with the Plans and Specifications for said PROJECT NO. STR 25-002 as proposed by the City Engineer.

Obtaining the Bidding Documents

Plans, specifications and proposed contract documents may be examined at the office of the City Engineer, Marshalltown, Iowa, and at the office of the City Clerk, Marshalltown, Iowa. Bidding Documents may be downloaded from the City of Marshalltown's web site upon registration at no cost. The documents may be downloaded at <https://www.marshalltown-ia.gov/Bids.aspx>.

A deposit of \$150 per paper set of plans, specifications and proposed contract documents will be charged, all of which will be refunded if the paper documents are returned in reusable condition within 14 days of the Award of Contract. If all paper documents are not returned in reusable condition and within 14 days, the deposit will be forfeited.

Pre-bid Conference

A pre-bid conference will not be held for the Project.

Instructions to Bidders.

A Bid must be accompanied by Bid security made payable to Owner in an amount of five (5) percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of the General Conditions or a certified check in an amount equal to five percent (5%) of the total amount of the bid, drawn on and certified payable by a solvent bank to the City Treasurer of the City. Such Bid bond will be issued in the form included in the Bidding Documents.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

The City Council reserves the right to reject any and all bids and to waive technicalities and irregularities and all bids must remain effective for a period of 30 days of opening same.

This Notice to Bidders is hereby published by authority of resolution duly adopted by the Council of the City of Marshalltown on the 11th day of February, 2025.

Owner: City of Marshalltown

By: Alicia Hunter

Title: City Clerk

OPINION OF PROBABLE CONSTRUCTION COST

SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

STR 25-002

City of Marshalltown, Iowa



ITEM NO.	ITEM	QUANTITY	UNIT	UNIT PRICE	COST
1	Pavement Removal	274.8	SY	\$ 30.00	\$ 8,244.00
2	Subbase, Modified, 8 Inch	274.8	SY	\$ 18.00	\$ 4,946.40
3	Full Depth Patch, PCC, 8-Inch	20.6	SY	\$ 160.00	\$ 3,296.00
4	Curb and Gutter, 30-Inch (Width), 8-Inch	476.0	LF	\$ 80.00	\$ 38,080.00
5	Pavement, Stamped Integral Colored PCC, 6 Inch	122.2	SY	\$ 250.00	\$ 30,550.00
6	Temporary Traffic Control	1	LS	\$ 7,500.00	\$ 7,500.00
7	Mobilization	1	LS	\$ 7,383.60	\$ 7,383.60
	Totals				\$ 100,000.00
	Contingency				\$ 10,000.00
	Project Total w/Contingency				\$ 110,000.00

2/6/2025

J:\PRJ\Projects by Year\2025\Center St-Hy-Vee Median\03-Bid\Bid Documents\Quantities_HY-VEE MEDIAN

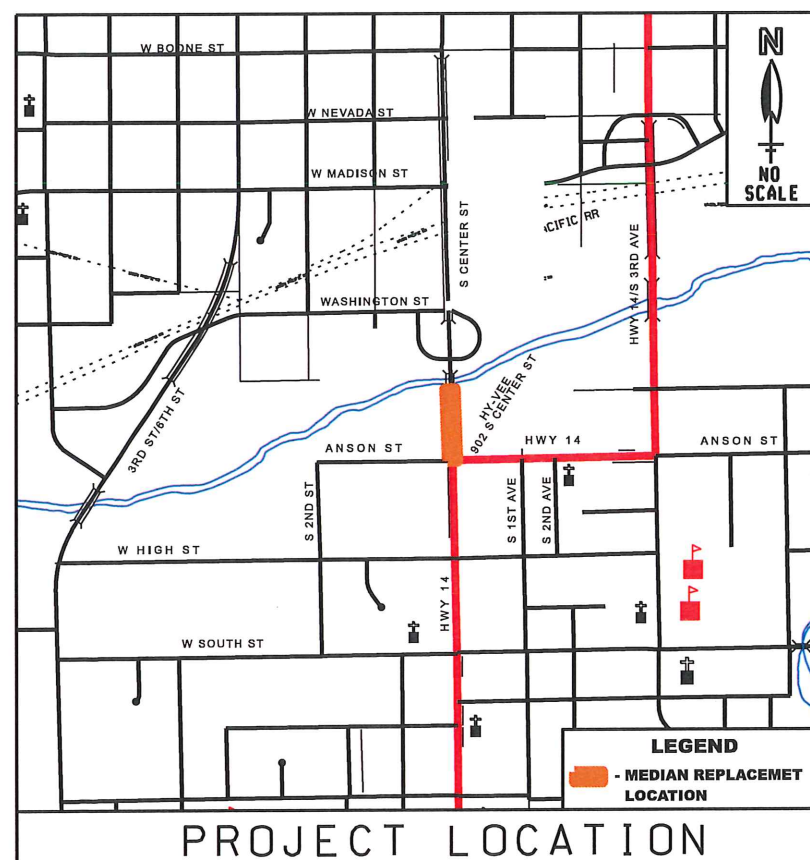


SOUTH CENTER STREET
MEDIAN REPLACEMENT PROJECT

PROJECT STR - 25-002

INDEX	
PAGE	DESCRIPTION
A.01	TITLE SHEET
B.01	QUANTITIES, EST. REF, & NOTES
C.01	DETAILS
D.01 - D.02	PLAN SHEETS
T.01 - T.02	TRAFFIC CONTROL SHEETS

POWER POLE	
UTILITY PEDESTAL	
PROPERTY PIN	
CONC. MONUMENT	
FIRE HYDRANT	
SIGNS	
GAS VALVE	
WATER VALVE	
GUY WIRE TIE	
TRAFFIC SIGNAL	
TREE	
BUSH	
FENCE	
CENTERLINE	
CONC. CURB & GUTTER	
WATER MAIN	
STORM SEWER MANHOLE	
STORM SEWER PIPE	
SANITARY SEWER MANHOLE	
SANITARY SEWER PIPE	



UTILITY COMPANIES

GAS & ELECTRIC: ALLIANT ENERGY

CONTACT: BILL FARRINGTON

PHONE: (641) 754-5811

WATER: MARSHALLTOWN WATER WORKS

CONTACT: ZACH MAXFIELD

PHONE: (641) 753-7913

SEWER: CITY OF MARSHALLTOWN

CONTACT: TROY McGAHUEY

PHONE: (641) 754-5749

TRAFFIC SIGNALS & CITY STREET LIGHTS

CITY OF MARSHALLTOWN

CONTACT: DAVID DEEMER

PHONE: (641) 754-5734

FIBER & COMMUNICATIONS

HEART OF IOWA

CONTACT: NATHAN BUTLER

PHONE: (641) 486-2211

IOWA COMMUNICATIONS NETWORK

CONTACT: TIM FLICKINGER

PHONE: (515) 725-4000

WINDSTREAM

CONTACT: BRYAN BOGAN

PHONE: (501) 748-6919

CENTURY LINK

CONTACT: TIM KEMPER

PHONE: (651) 378-2641

STANDARD SPECIFICATIONS

MARSHALLTOWN SUPPLEMENTARY
SPECIFICATIONS TO AMEND THE IOWA
STATEWIDE URBAN DESIGN AND
SPECIFICATIONS (SUDAS)

THE FOLLOWING CITY OF MARSHALLTOWN
STANDARDS SHALL BE CONSIDERED
APPLICABLE TO THE CONSTRUCTION WORK
ON THIS PROJECT



I hereby certify that this engineering document was prepared by me or under my personal supervision and that I am a duly Registered Professional Engineer under laws of the State of Iowa

Name : Heather Ann Thomas, P.E. Iowa Reg.No.23208

Signature Hester L. Thomas Date 02/06/25

My registration expires December 31, 2025

Sheet covered by this seal : (7) Sheets in Index



ESTIMATED PROJECT QUANTITIES				
SOUTH CENTER STREET MEDIAN REPAIR				
ITEM NO.	ITEM	QUANTITY	UNIT	AS-BUILT QUANTITY
1	Pavement Removal	274.8	SY	
2	Subbase, Modified, 8 Inch	274.8	SY	
3	Full Depth Patch, PCC, 8-Inch	20.6	SY	
4	Curb and Gutter, 30-Inch (Width), 8-Inch	476.0	LF	
5	Pavement, Stamped Integral Colored PCC, 6 Inch	122.2	SY	
6	Temporary Traffic Control	1.0	LS	
7	Mobilization	1.0	LS	

GENERAL NOTES

It is the Contractor's responsibility to contact the various utility companies to determine the exact location of all utilities and to provide adequate protection of poles, wires, cables, conduits and pipe lines. The Contractor will be liable for any damage to utilities caused by his work. Should any utilities need to be adjusted or moved, the contractor shall coordinate his work with the utility companies to provide ample time for the utility company to complete their work.

The Contractor shall protect private property from damage during construction and shall "hold harmless" the City for any damage to either public or private property or personal injury caused from his/her work.

The City reserves the right to determine the order in which the work will proceed. The contractor is required to submit a written plan outlining his traffic control plan, proposed schedule and sequence of construction, prior to beginning the construction.

Public Access: The Contractor shall exercise reasonable means to maintain the construction area open to local traffic for access to property's abutting the construction zone. In any event, the construction zone shall be accessible to emergency vehicles at all times.

CONSTRUCTION NOTES

No formal construction staking is anticipated. The City of Marshalltown will assist in marking pavement removals. It is intended the Contractor form the curb and gutter unit by extending the existing cross slope of the adjacent street through the gutter pan to set the curb forms based on the shown curb and gutter unit width.

Street Department will be responsible for the sign removal and re-striping pavement markings. Please contact Rick Legg (641)-485-9540 for coordination.

Contractor shall stage work to keep one northbound lane of traffic open at all times; refer to T sheets.

ESTIMATE REFERENCE

ITEM NUMBER	ITEM	DESCRIPTION
DIVISION 2 - EARTHWORK		
1	Pavement Removal	This item shall be in accordance with Section 7040 for full-depth patching. Item shall include sawing, breaking, removing, and disposing of existing pavement and reinforcing steel. Removals of any subgrade or subbase necessary to construct the typical curb/gutter and median section shall be incidental to this bid item. Payment shall be at the unit price per tenth of a square yard.
2	Subbase, Modified, 8 Inch	This item shall be in accordance with Section 2010. Item shall include furnishing, placing, compacting, and adjusting to the proper grade. Any necessary subgrade preparation needed to get to a compacted firm subgrade shall be incidental to this item. Payment shall be at the unit price per tenth of a square yard.
DIVISION 7 - STREETS AND RELATED WORK		
3	Full Depth Patch, PCC, 8-Inch	This item shall be in accordance with Section 7040. Item shall include furnishing and installing epoxy coated tie bars and dowel bars; furnishing and placing the patch material; surface curing and pavement protection; and joint sawing and filling. Initial concrete testing shall be completed by the City of Marshalltown. Contractor shall use an approved C4 or M4 Mix. Any rework or retesting necessary to correct work shall be at the Contractor's responsibility and cost. Payment shall be at the unit price per tenth of a square yard.
4	Curb and Gutter, 30-Inch (Width), 8-Inch PCC	This item shall be in accordance with Section 7010. Item shall include final subgrade/subbase preparation, bars and reinforcement, joints and sealing, surface curing and pavement protection. Contractor shall use an approved C4 Mix. Extra care shall be taken to ensure the curb is consolidated and a consistent mix with the gutter pan. Any rework or retesting necessary to correct work shall be at the Contractor's responsibility and cost. Payment shall be at the unit price per linear foot.
5	Pavement, Stamped Integral Colored PCC, 6 Inch	This item shall be in accordance with Section 7030. Item shall include additional thickness at thickened edges, bars and reinforcement, joints and sealing, surface curing and pavement protection. Contractor shall use an approved C4 Mix; slag is not allowed. Concrete color shall be liquid concrete pigment by Butterfield Color or approved equal: Butterfield, Color U11 - Autumn. Stamp shall be a basket weave brick design with traditional brick patterns. Any rework or retesting necessary to correct work shall be at the Contractor's responsibility and cost. Payment shall be at the unit price per tenth of a square yard.
DIVISION 8 - TRAFFIC CONTROL		
6	Temporary Traffic Control	This item shall be in accordance with Section 8030 and the drawings herein. This item includes a portable dynamic message sign, as well as, installation, maintenance, and removal of temporary traffic control; removal and reinstallation or covering of permanent traffic control devices that conflict with the temporary traffic control plan; and monitoring and documenting traffic control conditions. Temporary traffic control installed for more than 1 week shall be post mounted. The Contractor shall coordinate with the City of Marshalltown Utility division for the City to cover a traffic signal head, as shown on the drawings. Payment shall be lump sum.
DIVISION 11 - MISCELLANEOUS		
7	Mobilization	This item shall be in accordance with Section 11020. This item includes the movement of personnel, equipment, and supplies to the project site; the establishment of facilities necessary for the project; and bonding, permits, and other expenses incurred prior to construction. Payment shall be lump sum.

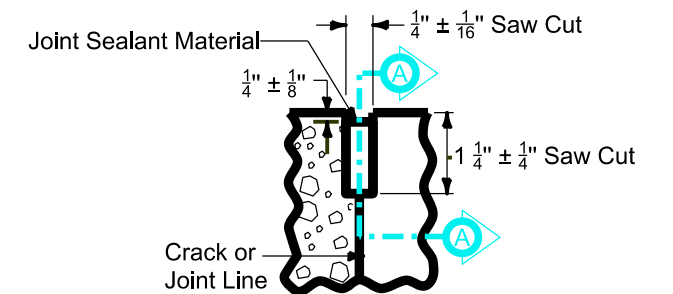
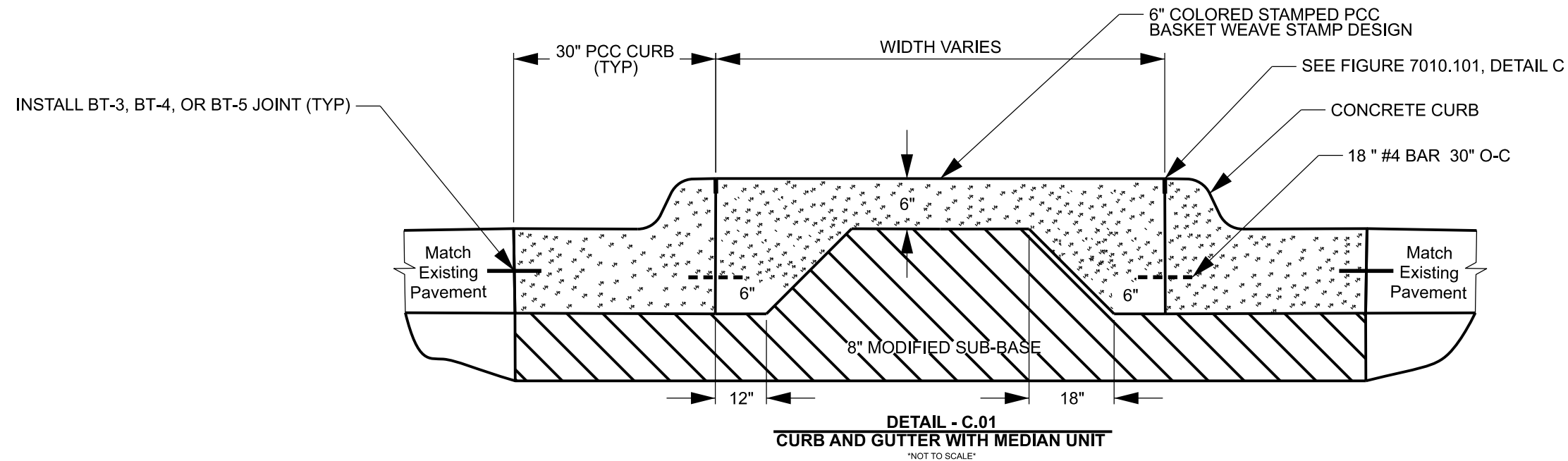
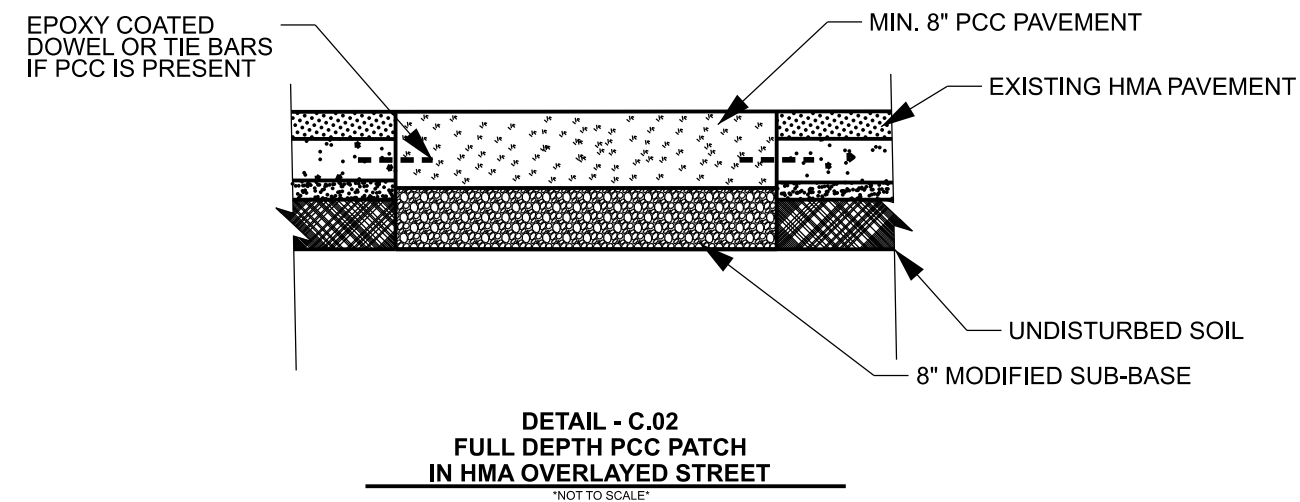
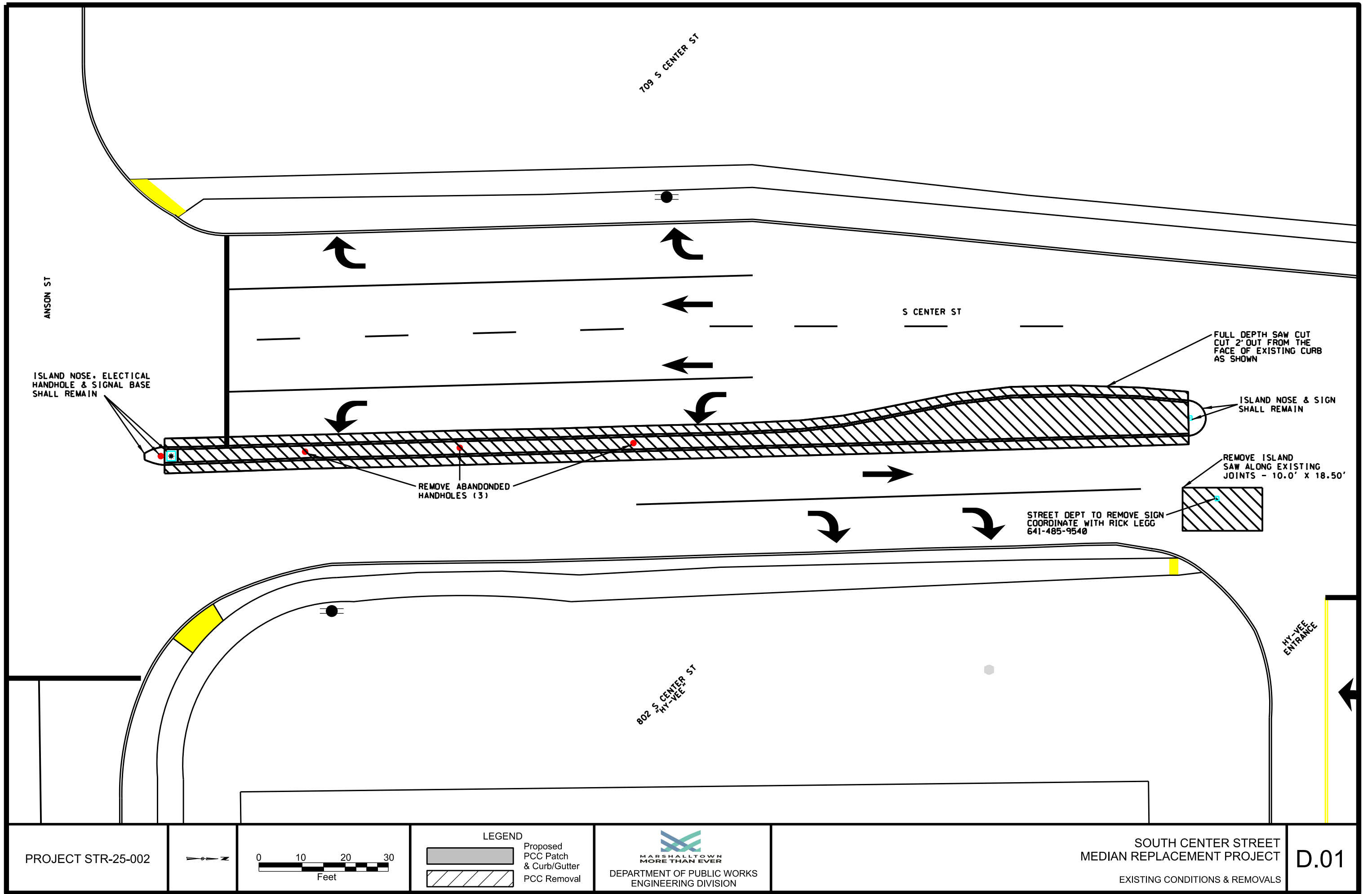


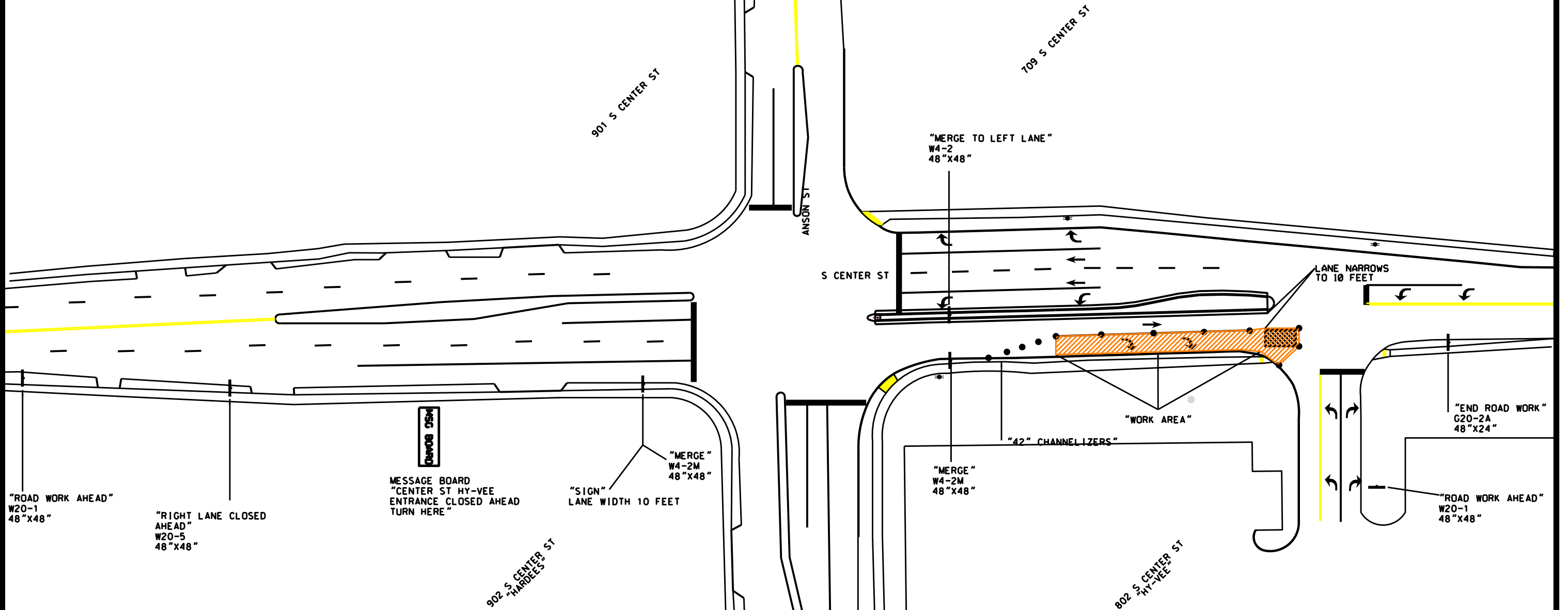
FIG. 7010.101 DETAIL C



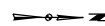


TRAFFIC NOTES

1. TRAFFIC CONTROL
SHEETS T.1 & T.2 ARE FOR
REFERENCE ONLY. PLEASE
FOLLOW IDOT/SUDAS TC
SECTION



PROJECT STR-25-002



SOUTH CENTER STREET
MEDIAN REPLACEMENT PROJECT

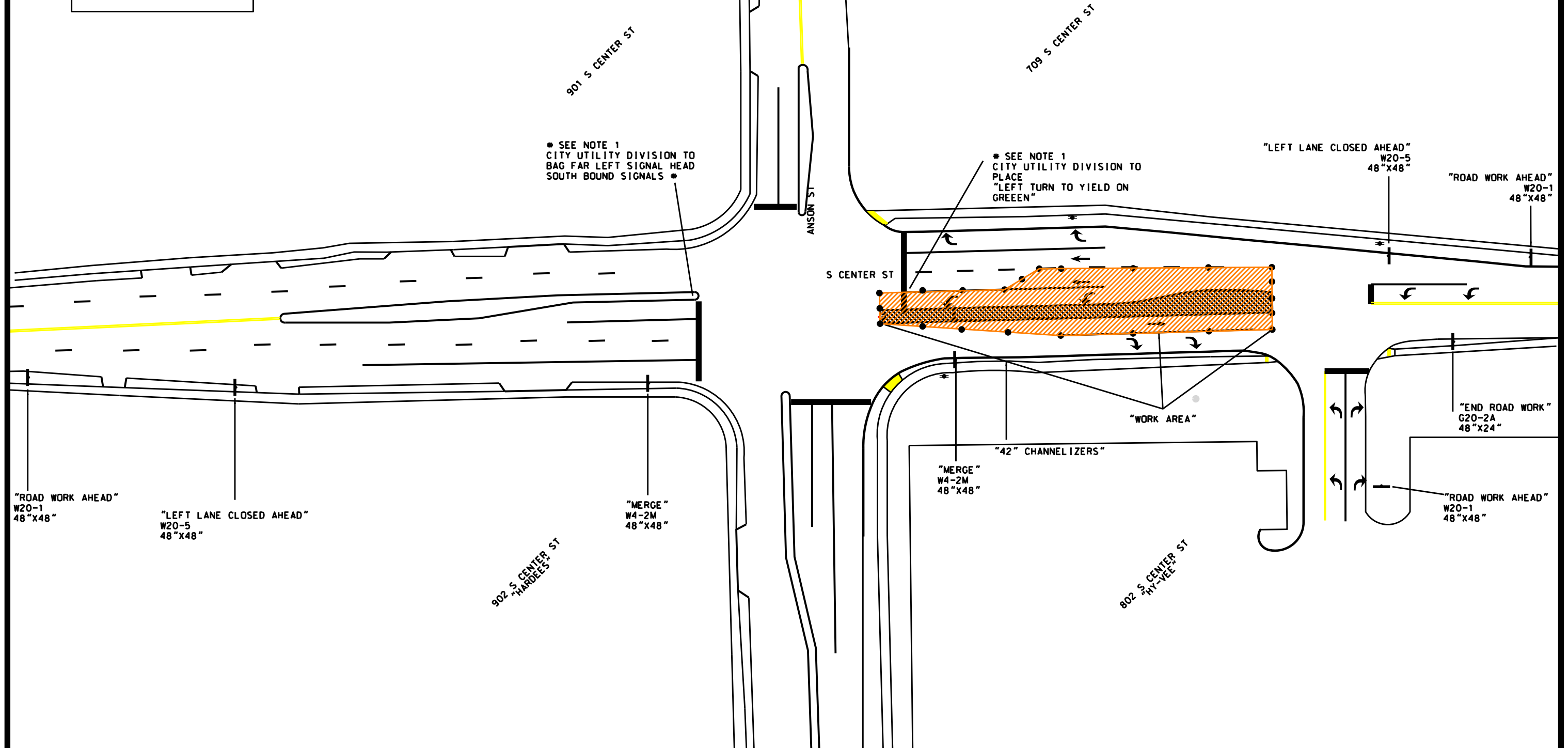
TRAFFIC CONTROL & STAGING - STAGE 1
HY-VEE TURN MEDIAN REMOVAL & PATCHING

T.01

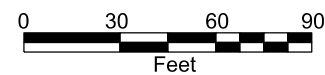
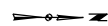
TRAFFIC NOTES

1. COORDINATE WITH DAVID DEEMER-(641-750-1652) ON BAGGING SOUTH BOUND LIGHT AND SIGN PLACEMENT

2. TRAFFIC CONTROL SHEETS T.1 & T.2 ARE FOR REFERENCE ONLY. PLEASE FOLLOW IDOT/SUDAS TC SECTION



PROJECT STR-25-002



SOUTH CENTER STREET
MEDIAN REPLACEMENT PROJECT

TRAFFIC CONTROL & STAGING - STAGE 2
CENTER MEDIAN REMOVAL & REPLACEMENT

T.02



Joel Greer, Mayor
Carol Webb, Administrator
Heather Thomas, Public Works
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5701

SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

STR 25-002

PREPARED BY:
City of Marshalltown

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. Signature: <u>Heather Ann Thomas</u> Date: <u>02/06/25</u> Name: <u>Heather Ann Thomas, P. E.</u> Iowa Reg. No. P23208 My license renewal date is December 31, 2025 Pages or sheets covered by this seal: <u>STR25002 Project Manual</u>
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BIDDING AND CONTRACT DOCUMENTS

OFFICIAL NOTICE OF HEARING AND LETTING

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

PROJECT NO. STR 25-002

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, PROPOSED FORM OF CONTRACT AND OPINION OF PROBABLE COST FOR THE SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT IN THE CITY OF MARSHALLTOWN, IOWA, AND THE TAKING OF BIDS FOR SUCH IMPROVEMENTS.

A public hearing will be held at 5:30 p.m. local time on the 24th day of February, 2025 in the Council Chambers, Second Floor, 10 West State Street, Marshalltown, Iowa, on the proposed plans, specifications, proposed form of contract, and the opinion of probable cost of improvements proposed to be constructed under PROJECT NO. STR 25-002, the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT, which is now on file in the office of the City Clerk and at said hearing any interested person may appear and file objection thereto or to the bidding process.

Sealed proposals based upon the proposed plans, specifications, proposed form of contract, opinion of probable costs of improvement, will be received at the City Clerk's Office located at 24 N. Center Street, Marshalltown, IA until 10:30 a.m. local time, on the 4th day of March, 2025 for the construction of the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT as described in the plans and specifications for Project No. STR 25-002, and which will be opened, read, and tabulated by the City Engineer or her designate at that time, will be acted upon by the City Council of said City at a meeting to be held in the Council Chambers on the 10th day of March, 2025 or at such later time and place as may then be fixed.

The proposed work will involve furnishing the labor, equipment, and materials necessary for constructing the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT in Marshalltown, Iowa as shown in the plans and specifications for PROJECT NO. STR 25-002, the SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT.

The estimated quantities of materials and labor to be furnished in the construction of said improvements and on which bids will be received are as follows:

Removal of pavement; construction of a full depth PCC patch; construction of curb and gutter; construction of a stamped integral color median, traffic control, and miscellaneous work associated with reconstruction of a median.

All work is to be done in strict compliance with the Plans and Specifications for said PROJECT NO. STR 25-002 as proposed by the City Engineer.

Obtaining the Bidding Documents

Plans, specifications and proposed contract documents may be examined at the office of the City Engineer, Marshalltown, Iowa, and at the office of the City Clerk, Marshalltown, Iowa. Bidding Documents may be downloaded from the City of Marshalltown's web site upon registration at no cost. The documents may be downloaded at <https://www.marshalltown-ia.gov/Bids.aspx>.

A deposit of \$150 per paper set of plans, specifications and proposed contract documents will be charged, all of which will be refunded if the paper documents are returned in reusable condition within 14 days of the Award of Contract. If all paper documents are not returned in reusable condition and within 14 days, the deposit will be forfeited.

Pre-bid Conference

A pre-bid conference will not be held for the Project.

Instructions to Bidders.

A Bid must be accompanied by Bid security made payable to Owner in an amount of five (5) percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of the General Conditions or a certified check in an amount equal to five percent (5%) of the total amount of the bid, drawn on and certified payable by a solvent bank to the City Treasurer of the City. Such Bid bond will be issued in the form included in the Bidding Documents.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

The City Council reserves the right to reject any and all bids and to waive technicalities and irregularities and all bids must remain effective for a period of 30 days of opening same.

This Notice to Bidders is hereby published by authority of resolution duly adopted by the Council of the City of Marshalltown on the _____ day of _____, 2025.

Owner: _____
City of Marshalltown

By: _____
Alicia Hunter

Title: _____
City Clerk

INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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ARTICLE 1—DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner requires that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the

Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

- 2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.
- 2.06 Electronic Documents
 - A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
 - 1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.
 - B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.
 - C. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

- D. Electronic Documents that are available in native file format include:
 - 1. None.
- E. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.
- F. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.
- G. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract

ARTICLE 3—PRE-BID CONFERENCE

- 3.01 A pre-bid conference will not be conducted for this Project.

ARTICLE 4—BID SECURITY

- 4.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **five (5)** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of the General Conditions or a certified check in an amount equal to five percent (5%) of the total amount of the bid, drawn on and certified payable by a solvent bank to the City Treasurer of the City. Such Bid bond will be issued in the form included in the Bidding Documents.

ARTICLE 5—SUBSTITUTE AND "OR EQUAL" ITEMS

- 5.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner.
- 5.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in

the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 6—PREPARATION OF BID

- 6.01 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

ARTICLE 7—OPENING OF BIDS

- 7.01 Bids will be opened and read aloud in City Hall (24 N Center Street, Marshalltown, Iowa) at 10:30 AM on Tuesday, March 4th, 2025.

ARTICLE 8—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 8.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.
- 8.02 Should there be any reason why the contract cannot be awarded within the period of time stated in the Bid Form, the time may be extended by mutual agreement between the Owner and the apparent successful Bidder.

ARTICLE 9—ENGINEER INFORMATION

- 9.01 The Engineering firm is: City of Marshalltown
- A. The Engineering firm’s contact person is: Heather Thomas, alternate Brad Bateman
 - B. The firm’s address is:
 - 1. 24 N Center St
 - 2. Marshalltown, Iowa 50158
 - 3. Phone (641) 754-5734
 - 4. Email: hthomas@marshalltown-ia.gov
bbateman@marshalltown-ia.gov

BIDDING DOCUMENTS

BID FORM FOR CONSTRUCTION CONTRACT
SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT
PROJECT NO. STR 25-002

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

City of Marshalltown – City Clerk
24 N. Center Street
Marshalltown, IA 50158.

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2—ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security;
- B. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
- C. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids; and
- D. Bidders Status Form.

ARTICLE 3—BASIS OF BID—UNIT PRICES

3.01 Unit Price Bids

A. Bidder will perform the following Work at the indicated unit prices:

ITEM NO.	ITEM DESCRIPTION	ESTIMATED QUANTITY	UNIT	BID UNIT PRICE	EXTENDED PRICE
1	Pavement Removal	274.8	SY	\$	\$
2	Subbase, Modified, 8 Inch	274.8	SY	\$	\$
3	Full Depth Patch, PCC, 8-Inch	20.6	SY	\$	\$
4	Curb and Gutter, 30-Inch (Width), 8-Inch	476.0	LF	\$	\$
5	Pavement, Stamped Integral Colored PCC, 6 Inch	122.2	SY	\$	\$
6	Temporary Traffic Control	1	LS	\$	\$
7	Mobilization	1	LS	\$	\$
	Project Total				\$

3.02 Bidder acknowledges that:

- A. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
- B. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 4—TIME OF COMPLETION

4.01 Bidder agrees that the Work will be substantially complete on or before **July 25th, 2025**, and will be completed and ready for final payment on or before **August 29th, 2025**.

ARTICLE 5—LIQUIDATED DAMAGES

- 5.01 Substantial Completion: Contractor shall pay Owner \$500 for each calendar day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
- 5.02 Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final

payment, Contractor shall pay Owner \$500 for each calendar day that expires after such time until the Work is completed and ready for final payment.

- 5.03 Liquidated damages for failing to timely attain Substantial Completion and Final Completion are not additive, and will not be imposed concurrently.
- 5.04 If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 6—*BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA*

6.01 Bid Acceptance Period

- A. This Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

6.02 Instructions to Bidders

- A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

6.03 Receipt of Addenda

- A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 7—BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address: _____

Bidder's Contractor License No.: (if applicable) _____

BID BOND (PENAL SUM FORM)

Bidder Name: [Full formal name of Bidder] Address (<i>principal place of business</i>): [Address of Bidder's principal place of business]	Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Address of Surety's principal place of business]
Owner Name: City of Marshalltown Address (<i>principal place of business</i>): 24 N. Center Street Marshalltown, IA 50158	Bid Project (<i>name and location</i>): SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT – Marshalltown, Iowa Bid Due Date: March 4, 2025
Bond Penal Sum: [Amount] Date of Bond: [Date]	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder	Surety
_____ <i>(Full formal name of Bidder)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name _____ <i>(Printed or typed)</i>	Name _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest _____ <i>(Signature)</i>	Attest _____ <i>(Signature)</i>
Name _____ <i>(Printed or typed)</i>	Name _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by Owner, or
 - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

BIDDER STATUS FORM

To be completed by all bidders

Part A

Please answer "Yes" or "No" for each of the following:

☐ Yes ☐ No My company is authorized to transact business in Iowa.

(To help you determine if your company is authorized, please review the worksheet on the next page).

☐ Yes ☐ No My company has an office to transact business in Iowa.

☐ Yes ☐ No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.

☐ Yes ☐ No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.

☐ Yes ☐ No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders

Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: _____/_____/_____ to _____/_____/_____ Address: _____

City, State, Zip: _____

Dates: _____/_____/_____ to _____/_____/_____ Address: _____

City, State, Zip: _____

Dates: _____/_____/_____ to _____/_____/_____ Address: _____

You may attach additional sheet(s) if needed. City, State, Zip: _____

To be completed by non-resident bidders

Part C

1. Name of home state or foreign country reported to the Iowa Secretary of State:

2. Does your company's home state or foreign country offer preferences to resident bidders, resident labor force preferences or any other type of preference to bidders or laborers? ☐ Yes ☐ No

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

_____ *You may attach additional sheet(s) if needed.*

To be completed by all bidders

Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

You must submit the completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156. This form has been approved by the Iowa Labor Commissioner.

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- ☐ Yes ☐ No My business is currently registered as a contractor with the Iowa Division of Labor.
- ☐ Yes ☐ No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
- ☐ Yes ☐ No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- ☐ Yes ☐ No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- ☐ Yes ☐ No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- ☐ Yes ☐ No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

CONTRACT DOCUMENTS

NOTICE OF AWARD

Date of Issuance:

Owner: City of Marshalltown Owner's Project No.: STR 25-002

Engineer: City of Marshalltown Engineer's Project No.: STR 25-002

Project: SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

Contract Name: SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated March 4, 2025 for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

The Contract Price of the awarded Contract is \$[**Contract Price**]. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Three unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☐ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **three** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions.
3. Other conditions precedent (if any): **n/a**

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents.

Owner: **City of Marshalltown, Iowa**

By (*signature*):

Name (*printed*): Joel Greer

Title: Mayor

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between the City of Marshalltown ("Owner") and [name of contracting entity] ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Removal of pavement; construction of a full depth PCC patch; construction of curb and gutter; construction of a stamped integral color median, traffic control, and miscellaneous work associated with reconstruction of a median.

ARTICLE 2 – THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT**

ARTICLE 3 – ENGINEER

3.01 The Owner has retained **the City of Marshalltown** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by **the City of Marshalltown**.

ARTICLE 4 – CONTRACT TIMES

4.01 Contract Times: Completion Date

A. Bidder agrees that the Work will be substantially complete on or before July 25th, 2025, and will be completed and ready for final payment on or before August 29th, 2025.

4.02 Liquidated Damages

A. Substantial Completion: Contractor shall pay Owner \$500 for each calendar day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.

B. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner \$500 for each calendar day that expires after such time until the Work is completed and ready for final payment.

4.03 Special Damages

- A. Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.01 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.
- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.01 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.
- C. The special damages imposed in this paragraph are supplemental to any liquidated damages for delayed completion established in this Agreement.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

- A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6 – CONTRACT DOCUMENTS

6.01 Contents

- A. The Contract Documents consist of all of the following:
 - 1. This Agreement.
 - 2. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
 - 3. General Conditions.
 - 4. Supplementary Conditions.
 - 5. Specifications as listed in the table of contents of the project manual (copy of list attached).
 - 6. Drawings (not attached but incorporated by reference) consisting of 9 sheets with each sheet bearing the following general title: **South Center Street Median Replacement Project**.
 - 7. Addenda (numbers [number] to [number], inclusive).
 - 8. Exhibits to this Agreement (enumerated as follows):
 - a. None
 - 9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:

- a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
 - e. Warranty Bond.
- B. The Contract Documents listed in Paragraph 6.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 6.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

6.02 General Conditions

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are the SUDAS Standard Specifications, General Provisions and Covenants, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor in the Supplementary Conditions.
- B. The General Conditions are available electronically at <https://iowasudas.org/manuals/specifications-manual/#division-1-general-provisions-and-covenants> .

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on **[indicate date on which Contract becomes effective]**
(which is the Effective Date of the Contract).

Owner:

City of Marshalltown

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

Joel Greer

(typed or printed)

Title:

Mayor

(typed or printed)

Attest:

(individual's signature)

Title:

Alicia Hunter

(typed or printed)

Address for giving notices:

City of Marshalltown

24 N. Center Street

Marshalltown, Iowa 50158

Designated Representative:

Name: Heather Thomas, P.E.

(typed or printed)

Title:

Public Works Director

(typed or printed)

Address:

24 N. Center Street

Marshalltown, Iowa 50158

Phone: (641) 754-5734

Email: hthomas@marshalltown-ia.gov

(If **[Type of Entity]** is a corporation, attach evidence of authority to sign. If **[Type of Entity]** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Contractor:

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

License No.:

(where applicable)

State:

PERFORMANCE BOND

Contractor Name: [Full formal name of Contractor] Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]	Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Address of Surety's principal place of business]
Owner Name: City of Marshalltown Mailing address (<i>principal place of business</i>): 24 North Center Street Marshalltown, IA 50158	Contract Description (<i>name and location</i>): SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT – Marshalltown, Iowa Contract Price: [Amount from Contract] Effective Date of Contract: [Date from Contract]
Bond Bond Amount: [Amount] Date of Bond: [Date] <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: ☐ None ☐ See Paragraph 16	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i> 	<i>(Full formal name of Surety) (corporate seal)</i>
By: <i>(Signature)</i>	By: <i>(Signature)(Attach Power of Attorney)</i>
Name: <i>(Printed or typed)</i>	Name: <i>(Printed or typed)</i>
Title:	Title:
Attest: <i>(Signature)</i>	Attest: <i>(Signature)</i>
Name: <i>(Printed or typed)</i>	Name: <i>(Printed or typed)</i>
Title:	Title:
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
 - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

- 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 - 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
14. Definitions
- 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
- 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
- 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
- 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
16. Modifications to this Bond are as follows: **“None”**

PAYMENT BOND

Contractor Name: [Full formal name of Contractor] Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]	Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Address of Surety's principal place of business]
Owner Name: City of Marshalltown Mailing address (<i>principal place of business</i>): 24 North Center Street Marshalltown, IA 50158	Contract Description (<i>name and location</i>): SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT – Marshalltown, Iowa Contract Price: [Amount, from Contract] Effective Date of Contract: [Date, from Contract]
Bond Bond Amount: [Amount] Date of Bond: [Date] <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: ☐ None ☐ See Paragraph 18	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
_____ <i>(Full formal name of Contractor)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct contract with the Contractor
 - 5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its

obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. Definitions

16.1. *Claim*—A written statement by the Claimant including at a minimum:

16.1.1. The name of the Claimant;

- 16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
- 16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
- 16.1.4. A brief description of the labor, materials, or equipment furnished;
- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
- 16.1.7. The total amount of previous payments received by the Claimant; and
- 16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2.*Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3.*Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4.*Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5.*Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows: **"None"**

WARRANTY BOND

Contractor Name: [Full formal name of Contractor] Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]	Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Insert address of Surety's principal place of business]
Owner Name: City of Marshalltown Address (<i>principal place of business</i>): 24 North Center Street Marshalltown, IA 50158	Construction Contract Description (<i>name and location</i>): SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT – Marshalltown, Iowa Contract Price: [Amount from Contract] Effective Date of Contract: [Date from Contract] Contract's Date of Substantial Completion: [Date from Contract]
Bond Bond Amount: [Amount] Date of Bond: [Date] Modifications to this Bond form: ☐ None ☒ See Paragraph 9	
Bond Period: Commencing after Substantial Completion of the Work under the Construction Contract, and continuing for four (4) years after such Substantial Completion.	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Warranty Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i> By: _____ <i>(Signature)</i> Name: _____ <i>(Printed or typed)</i> Title: _____ Attest: _____ <i>(Signature)</i> Name: _____ <i>(Printed or typed)</i> Title: _____	<i>(Full formal name of Surety) (corporate seal)</i> By: _____ <i>(Signature) (Attach Power of</i> Name: _____ <i>(Printed or typed)</i> Title: _____ Attest: _____ <i>(Signature)</i> Name: _____ <i>(Printed or typed)</i> Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract's Correction Period Obligations. The Construction Contract is incorporated herein by reference.
2. If the Contractor performs the Correction Period Obligations, the Surety and the Contractor shall have no obligation under this Warranty Bond.
3. If Owner gives written notice to Contractor and Surety during the Bond Period of Contractor's obligation under the Correction Period Obligations, and Contractor does not fulfill such obligation, then Surety shall be responsible for fulfillment of such Correction Period Obligations. Surety shall either fulfill the Correction Period Obligations itself, through its agents or contractors, or, in the alternative, Surety may waive the right to fulfill the Correction Period Obligations itself, and reimburse the Owner for all resulting costs incurred by Owner in performing Contractor's Correction Period Obligations, including but not limited to correction, removal, replacement, and repair costs.
4. The Surety's liability is limited to the amount of this Warranty Bond. Renewal or continuation of the Warranty Bond will not modify such amount, unless expressly agreed to by Surety in writing.
5. The Surety shall have no liability under this Warranty Bond for obligations of the Contractor that are unrelated to the Construction Contract. No right of action will accrue on this Warranty Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
6. Any proceeding, legal or equitable, under this Warranty Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and must be instituted within two years after the Surety refuses or fails to perform its obligations under this Warranty Bond.
7. Written notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown in this Warranty Bond.
8. Definitions
 - 8.1. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page of this Warranty Bond, including all Contract Documents and changes made to the agreement and the Contract Documents.
 - 8.2. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
 - 8.3. *Correction Period Obligations*—The duties, responsibilities, commitments, and obligations of the Contractor with respect to correction or replacement of defective Work, as set forth in the SUDAS General Conditions, as duly modified.
 - 8.4. *Substantial Completion*—As defined in the Construction Contract.
 - 8.5. *Work*—As defined in the Construction Contract.
9. Modifications to this Bond are as follows: **Bond shall be 100% of the contract amount for the first two (2) years and 25% of the contract amount for the last two (2) years.**

NOTICE TO PROCEED

Owner:	City of Marshalltown	Owner's Project No.:	STR 25-002
Engineer:	City of Marshalltown	Engineer's Project No.:	STR 25-002
Contractor:		Contractor's Project No.:	
Project:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Contract Name:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Effective Date of Contract:			

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Section 1080,1.02 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

Before starting any Work at the Site, Contractor must comply with the following:

[Note any access limitations, security procedures, or other restrictions]

Owner: City of Marshalltown

By (signature): _____

Name (printed): _____

Title: _____

Date Issued: _____

Copy: Engineer

CONTRACT CONDITIONS

GENERAL SUPPLEMENTAL SPECIFICATIONS

The General Supplemental Specifications for the work on this project are represented by the SUDAS Standard Specifications approved by the Board of Directors for the Iowa SUDAS Corporation.

SUPPLEMENTAL SPECIFICATIONS

These Supplementary Conditions amend or supplement the General Supplemental Specifications approved by the Board of Directors for the Iowa SUDAS Corporation subsequent to publication of the latest edition of the SUDAS Standard Specifications. They involve changes in the SUDAS Standard Specifications and apply only when specified in the contract documents. The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

Specifications adopted by a Jurisdiction that involve changes to the SUDAS Standard Specifications are as follow:

Section 1040 – Scope of Work

1.06 INCREASE OR DECREASE OF WORK

Add the following new paragraphs immediately after Paragraph C:

D. Adjustments in Unit Price

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the extended price of a particular item of Unit Price Work amounts to five (5) percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

Section 1070 – Legal Relations and Responsibility to the Public

3.01 PERFORMANCE, PAYMENT, AND MAINTENANCE BOND

Add the following subparagraphs to Paragraph C:

1. Contractor shall furnish a warranty bond issued in the form of EJCDC® C-612, Warranty Bond (2018) or other approved form. The warranty bond must be in a bond amount of **100 percent** of the final contract price for the first two (2) years and **25 percent** of the final Contract Price for the last two (2) years. The warranty bond period will extend to a date **four (4) years** after Substantial Completion of the Work.
3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 3.01 of the General Conditions.

Section 1080 – Prosecution and Progress

1.07 WORK ON SUNDAYS OR LEGAL HOLIDAYS

Add the following new subparagraphs immediately after Paragraph A:

1. No Work shall be done between 6:00pm and 7:00am without permission of Owner. However, emergency work may be done without prior permission.
2. Night Work may be undertaken as a regular procedure with the permission of Owner; such permission, however, may be revoked at any time by Owner if Contractor fails to maintain adequate equipment and supervision for the proper prosecution and control of the Work at night.
3. Owner's legal holidays are: New Year's Day, Good Friday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

Section 1090 - Measurement and Payment

1.05 PROGRESS PAYMENTS

Add the following new Paragraph D:

- D. Contractor's Application for Progress Payment shall be prepared on the EJCDC C-620 form provided in the Contract Documents, or other approved form.

ADDITIONAL FORMS

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: City of Marshalltown Owner's Project No.: STR 25-002
Engineer: City of Marshalltown Engineer's Project No.: STR 25-002
Contractor: Contractor's Project No.:
Project: SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT
Contract Name: SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

The following documents are attached to and made a part of this Certificate:

[List attachments such as punch list; other documents]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By (*signature*): _____

Name (*printed*): _____

Title: _____

NOTICE OF ACCEPTABILITY OF WORK

Owner: City of Marshalltown Owner's Project No.: STR 25-002
Engineer: City of Marshalltown Engineer's Project No.: STR 25-002
Contractor: Contractor's Project No.:
Project: SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT
Contract Name: SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT
Notice Date: Effective Date of the Construction Contract:

The Engineer hereby gives notice to the Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract's Contract Documents ("Contract Documents") and of the Agreement between Owner and Engineer for Professional Services dated **[date of professional services agreement]** ("Owner-Engineer Agreement"). This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.

This Notice reflects and is an expression of the Engineer's professional opinion.

This Notice has been prepared to the best of Engineer's knowledge, information, and belief as of the Notice Date.

This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor's Work) under the Owner-Engineer Agreement, and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner-Engineer Agreement.

This Notice is not a guarantee or warranty of Contractor's performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.

This Notice does not relieve Contractor of any surviving obligations under the Construction Contract, and is subject to Owner's reservations of rights with respect to completion and final payment.

Engineer

By (*signature*): _____

Name (*printed*): _____

Title: _____

CONTRACTOR'S APPLICATION FOR PAYMENT

Owner:	City of Marshalltown	Owner's Project No.:	STR 25-002
Engineer:	City of Marshalltown	Engineer's Project No.:	STR 25-002
Contractor:		Contractor's Project No.:	
Project:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Contract:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Application No.:		Application Date:	
Application Period:	From		to

1. Original Contract Price	\$	-
2. Net change by Change Orders	\$	-
3. Current Contract Price (Line 1 + Line 2)	\$	-
4. Total Work completed and materials stored to date	\$	
5. Retainage		
a. _____ X \$ _____ Work Completed	\$	
b. _____ X \$ _____ Stored Materials	\$	
c. Total Retainage (Line 5.a + Line 5.b)	\$	
6. Amount eligible to date (Line 4 - Line 5.c)	\$	
7. Less previous payments	\$	
8. Amount due this application (Line 6 – Line 7)	\$	
9. Balance to finish, including retainage (Line 3 - Line 7 – Line 8)	\$	

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:

- (1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;
- (2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and
- (3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor: _____

Signature: _____ **Date:** _____

Recommended by Engineer

By: _____

Title: _____

Date: _____

Approved by Owner

By: _____

Title: _____

Date: _____

Notes:

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner:	City of Marshalltown	Owner's Project No.:	STR 25-002
Engineer:	City of Marshalltown	Engineer's Project No.:	STR 25-002
Contractor:		Contractor's Project No.:	
Project:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Contract:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		

Application No.:		Application Period:		From		to		Application Date:			
A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Contract Information				Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
		Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)				
Original Contract											

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner:	City of Marshalltown	Owner's Project No.:	STR 25-002
Engineer:	City of Marshalltown	Engineer's Project No.:	STR 25-002
Contractor:		Contractor's Project No.:	
Project:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Contract:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		

Application No.:		Application Period:	From		to		Application Date:	
-------------------------	--	----------------------------	-------------	--	-----------	--	--------------------------	--

A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Contract Information				Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
		Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporate d in the Work	Value of Work Completed to Date (E X G) (\$)				
Change Orders											
					</						

Contractor's Application for Payment

Owner:	City of Marshalltown	Owner's Project No.:	STR 25-002
Engineer:	City of Marshalltown	Engineer's Project No.:	STR 25-002
Contractor:		Contractor's Project No.:	
Project:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Contract:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		

Application No.: _____ Application Period: From _____ to _____ Application Date: _____

[illegible]

CHANGE ORDER NO.: [#]

Owner:	City of Marshalltown	Owner's Project No.:	STR 25-002
Engineer:	City of Marshalltown	Engineer's Project No.:	STR 25-002
Contractor:		Contractor's Project No.:	
Project:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Contract Name:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Date Issued:		Effective Date of Change Order:	

The Contract is modified as follows upon execution of this Change Order:

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	Change in Contract Times [State Contract Times as either a specific date or a number of days]
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. [Number of previous Change Order] : \$ _____	[Increase] [Decrease] from previously approved Change Orders No.1 to No. [Number of previous Change Order] : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: \$ _____	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Contractor: Signature: _____ Date: _____	
Recommended by Engineer By: _____ Title: _____ Date: _____ Notes:	Approved by Owner By: _____ Title: _____ Date: _____

FIELD ORDER NO.: [FO#]

Owner:	City of Marshalltown	Owner's Project No.:	STR 25-002
Engineer:	City of Marshalltown	Engineer's Project No.:	STR 25-002
Contractor:		Contractor's Project No.:	
Project:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Contract Name:	SOUTH CENTER STREET MEDIAN REPLACEMENT PROJECT		
Date Issued:	Effective Date of Field Order:		

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____

Title: _____

Date: _____

PERMITTING

The City of Marshalltown will not require the Contractor to obtain a city Work within ROW permit.

The City will coordinate with Iowa DOT for getting the permission or permit (if necessary) for traffic control to be located in Highway 14 ROW.

MARSHALLTOWN SUPPLEMENTARY SPECIFICATIONS

PLEASE REFER TO THE CITY'S LATEST MARSHALLTOWN SUPPLEMENTARY
SPECIFICATIONS, AVAILABLE ELECTRONICALLY @

<https://www.marshalltown-ia.gov/DocumentCenter/View/9087/2023-Marshalltown-Supplementary-Specifications>

**RESOLUTION APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT
AND COST FOR THE WPCP SLUDGE THICKENING IMPROVEMENTS PROJECT,
IN THE CITY OF MARSHALLTOWN, IOWA, BEING PROJECT NO. WPC24-001**

WHEREAS, there was placed on file in the office of the Clerk of the City of Marshalltown, Iowa, proposed plans and specifications, proposed form of contract and estimated cost for a public improvement in the City of Marshalltown, Iowa, for the WPCP Sludge Thickening Improvements, Project No. WPC24-001, as fully set forth in the resolution ordering same, and that public notice of hearing on such plans, specifications and form of contract were duly published in the Marshalltown Times-Republican in time for hearing now before the Council, and

WHEREAS, written objections to the plans, specifications and form of contract have been called for and no such written objections have been filed with the City Clerk, and oral objections being called for and no oral objections being made in open Council, it is the decision of this Council that such plans, specifications, form of contract and estimate of cost should be approved.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the plans, specifications, form of contract and estimated cost heretofore placed on file and upon which public notice has been duly given and no objections thereto have been made either in writing or in open council, the Council does now adopt and approve the plans, specifications, form of contract and estimate of cost for Project No WPC24-001, being the WPCP Sludge Thickening Improvements Project in the City of Marshalltown, Iowa.

Passed this 24th day of February 2025, and signed this _____ day of February 2025.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor Greer and City Council
FROM: Heather Thomas, Public Works Director
DATE: February 10, 2025
RE: WPC Sludge Thickening Improvements (WPC 24-001) _Approval following Public Hearing

Strategic Plan:

- ☒ Strategy 1: Expand and improve development in the community.
- ☐ Strategy 2: Enhance Marshalltown's public image.
- ☒ Strategy 3: Continually improve and sustain the City's infrastructure, organization, and services.
- ☐ Strategy 4: Partner with citizens, for-profit, non-profit, and others to improve quality of life.

Plan Objective:

Plan for and construct new infrastructure; Plan and fund improvements to the City's infrastructure and buildings.

Recommendation:

Staff recommends approving plans, specifications, form of contract, and opinion of probable cost for said improvements following the public hearing.

Budget Impact:

The opinion of probable construction costs is \$3,317,000. We also recommend budgeting for a 5% construction contingency, or an additional \$166,000. This project is to be funded through sewer rates and Fund Balance (cash on hand) in the WPC Enterprise Fund (Fund 611). Sufficient funds are available for this project.

Description/Background:

Our treatment facility currently utilizes Dissolved Air Flotation (DAF) units to thicken sludge coming from the waste activated sludge (WAS) basins and sequencing batch reactors (SBR) from about 0.5% to about 4.0% prior to combining with primary sludge and sending to the digesters. We have two DAF units, one installed in 1980 and the other in 1986. Both are at (or past) their end of life.

This project is to replace our two DAF units with two Rotary Drum Thickener (RDT) units. The RDT units will be designed to thicken WAS/SBR sludge to 5.0% and will serve as equivalent replacement equipment for the DAF units. However, we plan to dual purpose the new RDT units so that they can also be used to thicken the sludge (Post Digestion Sludge) that we store for biosolids application. We currently store biosolids sludge at around 3%, have 4.75 MG storage available, and need to land apply 2x per year as we generate about 7.5 MG of biosolids sludge/year at 3%.

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff, Mark Mitchell,
Greg Nichols, Jeff Schneider, Gary Thompson



Utilizing the RDT units to thicken sludge that is stored and applied as biosolids from 3% to 6% (design, but target 7%) will allow our existing storage tanks to be able to accommodate a full year of biosolids sludge. This change would be needed in the event a portion of the WPC Farm, such as the Edgewood Industrial Park, is converted to Development ground as this is currently our Spring Biosolids application area.

In addition, the polymer system, thickened sludge pumps, digester transfer pump, supporting electrical equipment, and HVAC equipment will be replaced with the project.

Design services for this project were completed by HR Green.

The lead time on some of this equipment is quite lengthy. We proposed calendar dates for completion with substantial completion on or before March 19, 2027 and full completion on or before May 28, 2027. Liquidated damages have been set at \$1,000 / calendar day.

The bid timeline is as follows:

- Ordering construction at the February 10th, 2025 council meeting
- Pre-Bid Meeting at 10:00 AM, Tuesday, February 18th, 2025 @ WPC Plant
We had 16 representatives from 8 different companies attend the pre-bid. They represented prime contractors, subcontractors, and suppliers. Overall, we were pleased with the turn-out.
- Public Hearing at the February 24th, 2025 council meeting
- Receiving/Opening Bids at 11:00 AM, Tuesday, March 4th, 2025 @ City Hall
- Awarding Bid at the March 10th, 2025 council meeting.

Attachments: Official Notice of Hearing & Letting, Plans, Project Manual, Opinion of Probable Cost

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CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff, Mark Mitchell,
Greg Nichols, Jeff Schneider, Gary Thompson



SECTION 00120
NOTICE OF PUBLIC HEARING

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, PROPOSED FORM OF CONTRACT AND ESTIMATED COSTS FOR THE CONSTRUCTION OF PROJECT WPCP Sludge Thickening Improvements IN AND FOR THE City of Marshalltown, Marshalltown, IA 50158.

Notice is hereby given that there are on file with the Clerk, City of Marshalltown of the City of Marshalltown, Marshalltown, IA 50158, proposed drawings, project manual, proposed Form of Contract ("Contract Documents"), and opinion of probable cost for the construction of said improvement, for said Owner.

A hearing will be conducted thereon at a meeting of the City of Marshalltown to be held at 24 N. Center St., Marshalltown, IA 50158 at 5:30 PM, on February 24, 2025, at which time and place any person may appear and file objections to the proposed drawings, project manual, proposed Form of Contract ("Contract Documents"), and opinion of probable cost for the construction of said improvement.

Published upon order of the City of Marshalltown.

/s/ _____
Joel Greer, Mayor

ATTEST:

/s/ _____
Alicia Hunter, City Clerk

END OF SECTION 00120

**SECTION 00110
NOTICE TO BIDDERS**

FILING OF SEALED BIDS

Sealed Bids will be received by the City Clerk of the City of Marshalltown ("Owner"), at City of Marshalltown, 24 N. Center St., Marshalltown, IA 50158 until 11:00 AM, on March 4, 2025, for the construction of the proposed WPCP Sludge Thickening Improvements for said Owner, as described in the Specifications and drawings therefore on file in the office of the City Clerk of the City of Marshalltown. Bids will be publicly opened, read, and tabulated on the day and hour specified above, and will be acted upon by the Owner at that time or at such later time and place as the Owner may then determine.

GENERAL PROJECT DESCRIPTION

All Work, materials, and equipment are to be in accordance with the Contract Documents on file in the office of the City Clerk, and at the office of HR Green, Des Moines ("Engineer"), 5525 Merle Hay Road Suite 200, Johnston, IA 50131, by this reference made a part hereof as though fully set out and incorporated herein.

The Work for the said improvement, as required by the Contract Documents, is generally described as follows:

The DAF Building at Marshalltown's Water Pollution Control Plant (WPCP) houses two (2) dissolved air floatation (DAF) units for thickening of waste activated sludge (WAS) ahead of digestion. This project includes the replacement of Marshalltown's Water Pollution Control Plants the DAFs with two (2) new rotary drum thickener (RDT) units. One RDT will primarily be used for WAS thickening and the other RDT unit will serve as the standby WAS thickening unit and for thickening of digested sludge from 2.5% up to 7% solids. The polymer system, thickened sludge pumps, supporting electrical equipment, and HVAC equipment will be replaced with the project. The project also includes in-kind replacement of the Digester Transfer Pump for conveyance of digested sludge to the Thickened Sludge RDT.

The City of Marshalltown, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

Work under the proposed Contract Documents shall be commenced upon written Notice to Proceed anticipated to be issued within seven (7) days of the Effective Date of the Agreement

and shall be substantially complete on or before March 19, 2027 and fully complete on or before May 28, 2027, subject to any extension of time, which may be granted by the Owner.

PRE-BID CONFERENCE

Prospective bidders are encouraged to attend a pre-bid walk through of the proposed Work site which will be conducted jointly by the Owner and Engineer at 10:00 AM on February, 18, 2025 at Marshalltown WPCP. The objective of the walk through is to acquaint bidders with the site conditions.

OTHER PERTINENT INFORMATION

Each Bid shall be made on the Bid Form prepared for this purpose, which may be obtained from the Engineer. Any alteration in the official Bid Form will entitle the Owner, at its option, to reject the Bid from consideration. Each Bid shall be accompanied by a Bid Bond or a certified cashier's check, drawn on a solvent state or national bank, or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States, and filed in a sealed envelope separate from the one containing the Bid. The Bid Bond shall be substantially in the form set forth in the Contract Documents. The Contractor's certified check or Bid Bond shall be in an amount equal to five (5) percent of the amount of the Bid, made payable to the Owner. The check may be cashed for the full amount by the Owner or the Bid Bond forfeited in the full amount to the Owner as liquidated damages in the event the successful Bidder fails to enter into contract and file acceptable bonds satisfactory to the Owner assuring the faithful fulfillment of the contract and maintenance of said improvements as required by law within ten (10) days after the acceptance of the Bid.

The Owner reserves the right to reject any or all Bids, to readvertise for Bids or to defer action on the Bids received for a period not to exceed 30 days from and after the date and time specified in this Notice to Bidders for receiving said Bids, and to waive irregularities and informalities.

The successful Bidder will be required to furnish a Performance and Warranty Bond and a Payment Bond, each in an amount equal to one hundred (100) percent of the contract price. Said bonds to be issued by a responsible Surety approved by the Owner and shall guarantee that the Principal shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for or performing labor in the performance of the Work stated and the faithful performance of the contract and the terms and conditions therein contained and the guarantee and maintenance of said facilities in good repair and working conditions for not less than two (2) year(s) from the Notice of Acceptability of such improvements by the Owner.

Payment of the cost of said project will be made from cash on hand and/or received, payable from any fund or funds of Owner which may be legally used for such purpose, including, but not limited to, any of the following sources, or any combination thereof, at the sole discretion of Owner: (1) past and/or future earnings of Owner's utility; (2) proceeds of the sale and issuance of General Obligation Bonds and/or revenue bonds (or project notes anticipating the sale of such bonds); (3) federal, State or local grants or loans; and (4) proceeds from the sale of warrants, as authorized

HR Green, Inc.
Project No. 2303827

WPCP Sludge Thickening Improvements
Marshalltown, IA

by Section 384.57 of the Code of Iowa. Payments will be made to the Contractor in accordance with the Contract Documents.

Construction items and materials included in the Project are exempt from State of Iowa and Local Option Sales and Use Taxes. Contractor is responsible for obtaining the exemption on items included, as provided by law or for applying for reimbursement for such taxes paid. Contractor shall pay all other taxes required to be paid by Contractor in accordance with the laws and regulations of the place of the Project that are applicable during the performance of the Work. Contractor shall NOT include Sales and Use Tax in Contractor's bid. For more information on this exemption, please check the State of Iowa's website: www.state.ia.us/tax/business/Contr-ExEnt-Index.html

By virtue of statutory authority, preference will be given to products and provisions grown and coal produced within the State of Iowa, and to Iowa domestic labor, to the extent lawfully required under Iowa statutes provided that the award of contract will be made to the lowest responsible bidder submitting the lowest responsive bid, which shall be determined without regard to state or local laws whereby preference is given on factors other than the amount of the Bid.

The proposed Contract Documents are on file with the Owner and Engineer for public examination. Copies of said Contract Documents and one unbound copy of the Bid Form may be secured at the office of HR Green, Des Moines, 5525 Merle Hay Road Suite 200, Johnston, IA 50131, Phone Number 515-278-2913.

This public improvement is being constructed pursuant to the provisions of Chapters 26 and 573 of the latest edition of the Iowa Code, including revisions.

Published upon order of the City of Marshalltown.

City of Marshalltown

/s/ _____
Joel Greer, Mayor

ATTEST:

/s/ _____
Alicia Hunter, City Clerk

END OF SECTION 00110

**Marshalltown WPCP
Sludge Thickening Improvements
Final Cost Opinions**

Item		Cost	
Demolition		\$107,000	
Site work			
Manhole Structures		\$37,000	
Sidewalk Repairs		\$14,000	
Process Equipment			
RDT Equipment		\$766,000	
Polymer Feeder Blenders		\$85,000	
Thickened Sludge Pumps		\$103,000	
Digester Transfer Pump		\$54,000	
WAS Pumps		\$58,000	
Structural Items			
Support Structure for RDTs		\$20,000	
Pipe Supports, Containment Curb, and Wall Penetrations		\$57,000	
FRP Containment Curb Grating		\$4,000	
Concrete Repair		\$84,000	
RDT Building Interior Painting		\$25,000	
Process Piping		\$421,000	
HVAC & Plumbing		\$240,000	
Electrical and I&C		\$619,000	
Subtotal		\$2,694,000	
Contingency		0.00%	\$0
Mobilization & Demobilization		3.00%	\$81,000
Subtotal		\$2,775,000	
Contractor's Overhead & Profit		15.00%	\$417,000
Contractor's Bond and Insurance		4.50%	\$125,000
Total Opinion of Probable Construction Cost		\$3,317,000	

WPCP SLUDGE THICKENING IMPROVEMENTS

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

2025

CITY PROJECT NUMBER: WPC 24-001

CERTIFICATION

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Joseph P. Frankl</u> <u>2/5/2025</u> JOSEPH P. FRANKL, P.E. DATE License Number: 23145 My license renewal date is December 31, 2026. Pages or sheets covered by this seal: G-SHEETS, D-SHEETS & P-SHEETS
---	---

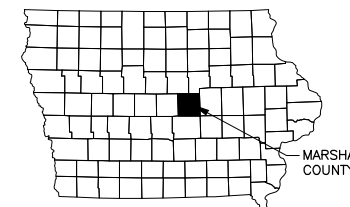
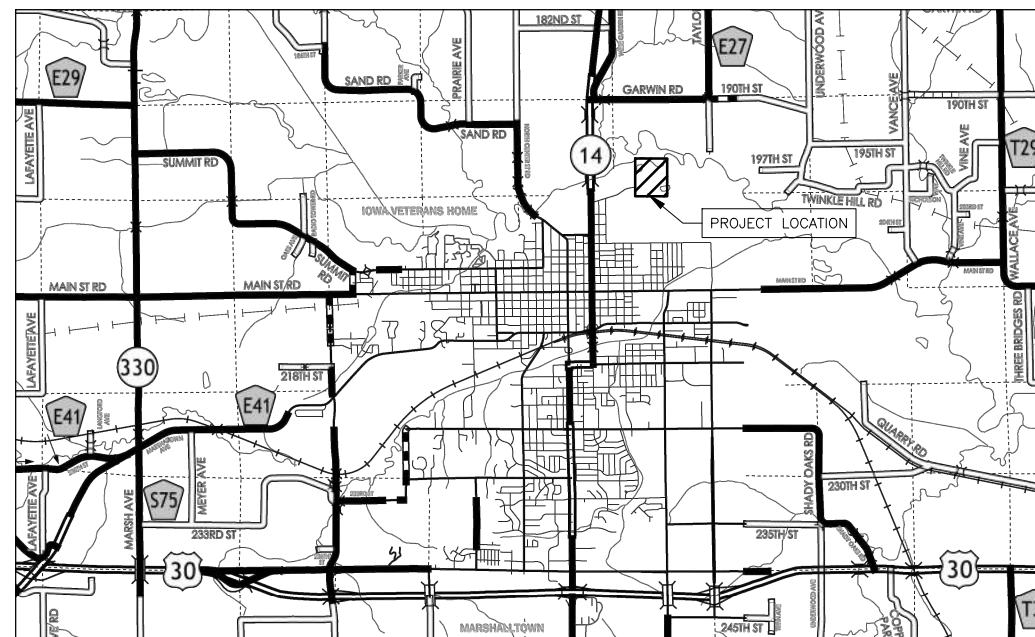
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Dennis L. Neumann</u> <u>2/5/2025</u> DENNIS L. NEUMANN, P.E. DATE License Number: 18269 My license renewal date is December 31, 2026. Pages or sheets covered by this seal: S-SHEETS
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	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Douglas A. Sullivan</u> <u>2/5/2025</u> DOUGLAS A. SULLIVAN, P.E. DATE License Number: 15589 My license renewal date is December 31, 2026. Pages or sheets covered by this seal: M-SHEETS
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	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Andrew R. Venzke</u> <u>2/5/2025</u> ANDREW R. VENZKE, P.E. DATE License Number: 17764 My license renewal date is December 31, 2025. Pages or sheets covered by this seal: E-SHEETS
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	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Daniel J. Origer</u> <u>2/5/2025</u> DANIEL J. ORIGER, P.E. DATE License Number: P26358 My license renewal date is December 31, 2025. Pages or sheets covered by this seal: IC-SHEETS
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LOCATION MAP



5525 MERLE HAY ROAD, SUITE 200 | JOHNSTON, IOWA 50131
Phone: 515.278.2913 | Toll Free: 800.728.7805 | Fax: 713.965.0044 | HRGreen.com

DRAWN BY: BDB JOB DATE: 2025
APPROVED: JPF JOB NUMBER: 2303827
CAD DATE: 1/28/2025 10:13:39 AM
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

GENERAL
COVER SHEET

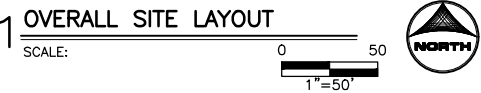
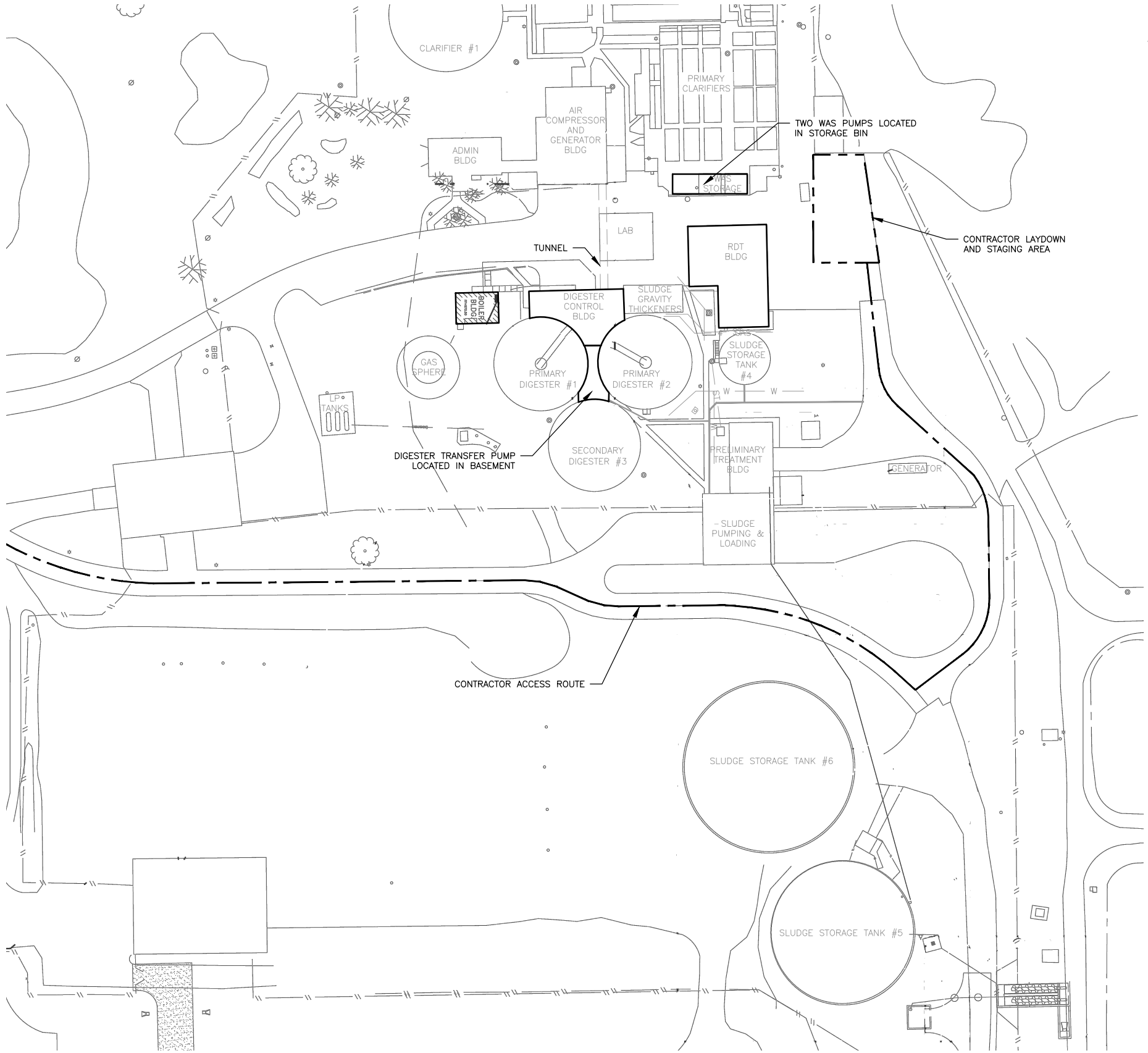
SHEET NO.
G.000

SHEET INDEX

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G.001	OVERALL SITE PLAN & GENERAL NOTES
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C.101	YARD PIPING PLAN
C.500	CIVIL DETAILS
C.501	CIVIL DETAILS
DEMOLITION	
D.100	RDТ BUILDING DEMOLITION PLAN
D.101	RDТ BUILDING MECHANICAL DEMOLITION PLAN
D.102	RDТ BUILDING ELECTRICAL DEMOLITION PLAN
D.200	DEMOLITION PHOTOS
D.300	DIGESTER CONTROL BUILDING DEMOLITION PLAN
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S.500	STRUCTURAL SECTIONS & DETAILS
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M.600	MECHANICAL SCHEDULES
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E.000	ELECTRICAL LEGEND & ABBREVIATIONS
E.001	ELECTRICAL SITE PLAN
E.100	RDТ BUILDING PLAN
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E.301	DIGESTER TUNNEL PLAN
E.302	BOILER BUILDING PLAN
E.400	WAS HOLDING BASINS PLAN
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INSTRUMENTATION & CONTROL	
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IC.100	EXISTING DIGESTER & WAS STORAGE P&ID
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IC.102	RDТ 2 P&ID
IC.500	NETWORK DIAGRAM
IC.501	VENTILATION CONTROL DIAGRAM
IC.600	I&C SCHEDULES

GENERAL NOTES:

- "SCREENED" (LIGHT) DELINEATION SHOWN IN THIS SHEET DENOTES EXISTING CONDITIONS (UNLESS NOTED OTHERWISE). "SCREENED" INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS AND FIELD SURVEY, IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING OF MATERIALS AND BEGINNING CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
- THE SITE SHALL BE KEPT ORDERLY AND REASONABLY CLEAN AT ALL TIMES DURING CONSTRUCTION. AT THE CONCLUSION OF CONSTRUCTION, THE SITE SHALL BE CLEANED THOROUGHLY OF ALL WASTE, RUBBLE, DEBRIS, AND UNUSED MATERIALS.
- CONTRACTOR RESPONSIBLE TO CLEAN ALL TRACKED DIRT FROM PAVED SURFACES AT THE END OF EACH WORK DAY. CONTRACTOR RESPONSIBLE TO SWEEP HAUL AND STAGING ROUTE AS NECESSARY TO KEEP CLEAR OF DIRT AND DEBRIS. WATER SHALL BE USED DURING STREET SWEEPING EXCEPT DURING FREEZING CONDITIONS.
- CONTRACTOR SHALL NOT BE REQUIRED TO HAUL ANY EXCESS EXCAVATION OFF-SITE. CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR STOCKPILE LOCATIONS.
- CONTRACTOR SHALL COORDINATE WITH OWNER FOR CONSTRUCTION STAGING AND STORAGE AREAS. STAGING AND STORAGE AREAS MAY BE LIMITED DUE TO OTHER ONGOING CONSTRUCTION PROJECTS.
- CONTRACTOR IS RESPONSIBLE FOR SECURITY OF THEIR PROJECT AREA. OWNER IS NOT RESPONSIBLE FOR SECURED/UNSECURED MATERIALS STORED ONSITE.
- ALL DISTURBED GRASSY AREAS SHALL BE SEEDED UNLESS OTHERWISE NOTED. SEEDED AREAS SHALL RECEIVE 3" TOP SOIL, SEED, MULCH, AND WATER IN ACCORDANCE WITH SPECIFICATION SECTION 32 9219.
- REFER TO SPECIFICATION SECTION 01 1000 FOR SEQUENCING REQUIREMENTS.
- ONE WEEK PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY:
A. CITY OF MARSHALLTOWN
B. ALL UTILITY COMPANIES
C. ENGINEER
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING "AS-BUILT" INFORMATION FOR ALL NEW CONSTRUCTION. RECORD DRAWINGS SHALL BE MAINTAINED BY THE CONTRACTOR AND KEPT UP TO DATE AS THE WORK PROGRESSES. THE ORIGINAL RECORD DRAWINGS SHALL BE PROVIDED TO THE ENGINEER UPON COMPLETION OF CONSTRUCTION.
- THE CONTRACTOR SHALL VIDEO RECORD THE ENTIRE PROJECT AREA PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES FOR THE PURPOSE OF DOCUMENTING EXISTING CONDITIONS. THE CONTRACTOR SHALL PROVIDE ONE COPY TO THE CITY AND ONE COPY TO THE ENGINEER. THE CONTRACTOR SHALL LEAVE THE EXISTING ELEMENTS AND FACILITIES IN EQUAL OR BETTER-THAN-ORIGINAL CONDITION AND TO THE SATISFACTION OF THE ENGINEER.
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ACCESS TO THE SITE THROUGHOUT CONSTRUCTION, INCLUDING SNOW REMOVAL AS APPLICABLE.
- THE GRADING LIMITS FOR THE WORK SITE IN THIS CONTRACT ARE WITHIN THE LIMITS WHICH DO NOT REQUIRE APPLICATION AND FILING OF A "NOTICE OF INTENT" FOR A PERMIT TO DISCHARGE STORM WATER UNDER IOWA GENERAL PERMIT NO. 2. EVEN THOUGH A GENERAL PERMIT NO. 2 NOTICE OF INTENT MAY NOT BE NEEDED, THE CITY REQUIRES THAT "BEST MANAGEMENT PRACTICES" FOR EROSION CONTROL BE FOLLOWED. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND INSTALL SILT FENCE, FILTER SOCK, AN/OR ANY OTHER EROSION CONTROL MEASURES THAT ARE TYPICALLY USED IN EROSION CONTROL TO MEET BEST MANAGEMENT PRACTICES OR AS REQUIRED BY OWNER/ENGINEER.



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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

GENERAL
OVERALL SITE PLAN & GENERAL NOTES

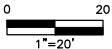
SHEET NO.
G.001

CIVIL LEGEND

	BENCHMARK, CONTROL POINT, ELEVATION INDICATOR		GAS METER
	CONCRETE MONUMENT		CURB INTAKE
	IRON PIN FOUND		HANDICAP INTAKE
	IRON PIN SET		LIGHT POLE
	OPEN PIPE		SANITARY MANHOLE
	ROW RAIL		MONITORING WELL
	SECTION CORNER		POST
	CHISELED X		RAILROAD SIGN
	AREA INTAKE		SATELLITE DISH
	FIRE HYDRANT		SIGN
	GUY WIRE		SIGN
	MAILBOX		SOIL BORING
	POWERPOLE		TREE STUMP
	CONIFEROUS TREE		TELEPHONE BOX
	DECIDUOUS TREE		TELEPHONE PEDESTAL
	CORNER MONUMENT		TRAFFIC SIGNAL
	BEEHIVE INTAKE		TRAFFIC SIGN
	CABLE BOX		YARD LIGHT
	CLEAN OUT		BURIED VALVE
	ELECTRIC METER		
	ELECTRIC BOX		
	PHONE BOOTH		



TRUE NORTH ARROW



CIVIL SCALE BAR

1 BLDG DETAIL OR SECTION
SCALE: TO SCALE

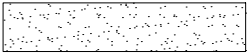
1 BLDG PLAN/DETAIL/SECTION
NOT TO SCALE OR CIVIL
NTS



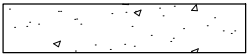
PROPOSED PAVEMENT DEMOLITION



PROCESS/MECHANICAL DEMOLITION



EXISTING GRAVEL



EXISTING PAVING

NOTE:

NOT ALL SYMBOLS SHOWN IN THESE LISTS MAY BE USED IN THIS PROJECT. CONTACT ENGINEER FOR CLARIFICATION OF ANY DISCREPANCIES.

UTILITY NOTES

WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. THE CONTRACTOR SHALL AFFORD ACCESS TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IF IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH PRESENTLY NOT KNOWN OR SHOWN, IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERETO. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR ANY INTERFERENCE OR DELAY CAUSED BY SUCH WORK.

THE CONTRACTOR IS REQUIRED TO UTILIZE THE UTILITY ONE-CALL SERVICE AT (800) 292-8989 AT LEAST 48 HOURS PRIOR TO EXCAVATING ANYWHERE ON THE PROJECT.

	1050	EXISTING MAJOR CONTOUR
	1049	EXISTING MINOR CONTOUR
	1" ALP	EXISTING AIR LINE
		EXISTING FENCE
		EXISTING ROW FENCE
		EXISTING GRAVEL SURFACE
		EXISTING SECTION LINE
	UGTV	EXISTING UNDERGROUND TELEVISION
	OE	EXISTING OVERHEAD ELECTRIC
	UE	EXISTING UNDERGROUND ELECTRIC
	FO	EXISTING FIBEROPTIC
	G	EXISTING GAS
	6" SAN	EXISTING SANITARY SEWER
	10" ST	EXISTING STORM SEWER
	UGT	EXISTING UNDERGROUND TELEPHONE
	1041	EXISTING MINOR CONTOUR
	1045	EXISTING MAJOR CONTOUR
		EXISTING WATER
	W	EXISTING FLUSHING WATER
	W3	EXISTING RIGHT OF WAY
	R/W	EXISTING PROPERTY LINE
	PL	
	1041	PROPOSED MINOR CONTOUR
	1045	PROPOSED MAJOR CONTOUR
		TREE PROTECTION
		PROPOSED FENCE
		PROPOSED PERMANENT EASEMENT
		PROPOSED SILT FENCE
		PROPOSED TEMPORARY EASEMENT
		PROPOSED CULVERT
		DEMOLITION
	GAS	PROPOSED GAS LINE
	W3	PROPOSED PLANT EFFLUENT WATER
	SAN	PROPOSED SANITARY SEWER
	ST	PROPOSED STORM SEWER
	FIRE	PROPOSED FIRE PROTECTION WATER
	W	PROPOSED POTABLE WATER
	IRR	PROPOSED POTABLE WATER
		PROPOSED CRUSHED STONE
		PROPOSED CONCRETE PAVING
		PROPOSED HOT-MIX ASPHALT PAVING

EROSION CONTROL NOTES:

- THE CITY REQUIRES THAT "BEST MANAGEMENT PRACTICES" FOR EROSION CONTROL BE FOLLOWED. THE CONTRACTOR SHALL DETERMINE THE LOCATION AND INSTALL FILTER SOCK AND/OR SILT FENCE AS SPECIFIED IN THE BID ITEMS OR ANY OTHER EROSION CONTROL MEASURES THAT ARE TYPICALLY USED IN EROSION CONTROL. CONTRACTOR SHALL ENSURE THAT TEMPORARY STABILIZATION MEASURES ARE INSTALLED AND MAINTAINED FOR ANY DISTURBED AREAS THAT CANNOT BE SEEDED UNTIL A LATER DATE. ALL COSTS SHALL BE INCLUDED IN PROJECT COSTS.
- SEQUENCE OF EROSION AND SEDIMENT CONTROL EVENTS:
 - INSTALL INLET PROTECTION AROUND EXISTING INTAKES.
 - INSTALL PERIMETER EROSION CONTROL.
 - INSTALL EROSION CONTROL AROUND ANY TOPSOIL OR EXCESS SOIL STOCKPILES. APPLY TEMPORARY SEEDING TO ALL TOPSOIL OR EXCESS SOIL STOCKPILES.
 - INSTALL STONE SUBBASE ON PAVED AREAS FOLLOWING COMPLETION OF GRADING.
 - APPLY TEMPORARY SEEDING TO ALL DENUDED AREA WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR 14 DAYS OR MORE. FERTILIZE AND LIME, IF NEEDED. APPLY MULCH ON SLOPES GREATER THAN 4:1 (H:V) OR DURING SUMMER DRY WEATHER.
 - DESTROY TEMPORARY AND APPLY PERMANENT SEEDING TO ALL DISTURBED AREAS NOT TO BE HARD SURFACED. FERTILIZE AND MULCH PERMANENT SEEDING AS REQUIRED.
 - WHEN CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED WITH PERMANENT SEEDING, REMOVE ACCUMULATED SEDIMENT FROM ANY SEDIMENT BASINS, REMOVE AND RESEED ANY AREAS DISTURBED BY THE REMOVALS.

HORIZONTAL AND VERTICAL CONTROL INFORMATION NOTES:

- THE CONTRACT DOCUMENTS PROVIDE HORIZONTAL AND VERTICAL CONTROL INFORMATION NEEDED FOR CONSTRUCTION OF THE PROPOSED IMPROVEMENTS. THESE ELEVATIONS AND COORDINATES WERE FROM PREVIOUS CONSTRUCTION DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DETAILED CONSTRUCTION SURVEYING AND SHALL VERIFY ALL HORIZONTAL AND VERTICAL INFORMATION PRIOR TO CONSTRUCTION AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
- EXISTING BENCHMARKS VERIFIED AND TIED TO LOCAL CONTROL. BENCHMARKS ORIGINALLY FROM WPCP BIOSOLIDS IMPROVEMENTS PROJECT, 2002, PROJECT NUMBER 2407-00A.
- HORIZONTAL CONTROL IS REFERENCED TO NAD83 (2011) IOWA STATE PLANE, NORTH ZONE.
- VERTICAL CONTROL IS REFERENCED TO NAVD88.

VERIFIED EXISTING VERTICAL CONTROL INFORMATION:

BM#2
CHISELED "X" NE CORNER OF AERATION TANK PLANT NO. 3
ELEV = 872.88

BM#3
CHISELED "X" EAST OF WAS STORAGE BASINS
ELEV = 873.85

SET ADDITIONAL CONTROL HORIZONTAL AND VERTICAL INFORMATION:

CP-50
BM 50 PK NAIL IN PAVEMENT
N: 3487308.93
E: 5085255.56
ELEV = 869.73

CP-51
BM 51 CUT "X" IN SIDEWALK
N: 3487239.17
E: 5085219.68
ELEV = 869.94

CP-52
BM 52 CUT "X" IN PAVEMENT
N: 3487387.07
E: 5085372.44
ELEV = 870.39

CP-53
BM 53 CUT "X" IN TOP OF CONCRETE
N: 3487626.31
E: 5085284.10
ELEV = 873.80

CP-54
BM 54 PK NAIL IN SIDEWALK
N: 3487253.32
E: 5085205.59
ELEV = 870.04

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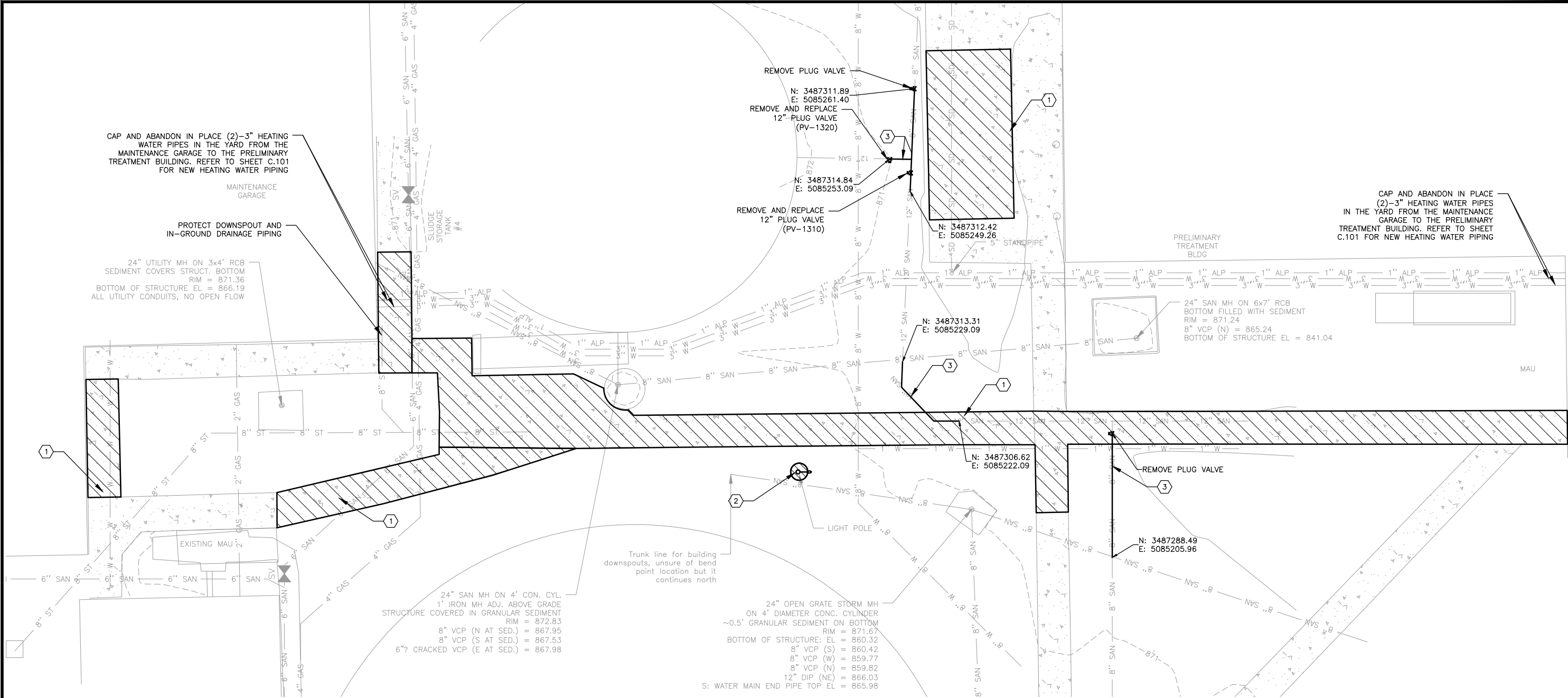
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

CIVIL
CIVIL LEGEND & REQUIREMENTS

SHEET NO.
C.000



KEY NOTES: #

- 1. REPAIR ALL DISTURBED SIDEWALK TO MATCH EXISTING, SEE SECTION ON SHEET C.500.
- 2. REMOVE LIGHT POLE AS REQUIRED FOR UNDERGROUND UTILITY WORK. RELOCATE AS INDICATED ON SHEET C.101. FIELD VERIFY AND REROUTE LIGHT POLE CONDUIT AS NEEDED FOR REMOVAL AND RELOCATION.
- 3. REMOVE PIPE.

GENERAL NOTES:

- 1. CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH UTILITY PROVIDERS FOR REMOVALS OF EXISTING UTILITIES.
- 2. ALL EXISTING FACILITIES SHOWN FOR DEMOLITION SHALL BE FIELD VERIFIED AND LOCATED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING ITEMS, UTILITIES, AND/OR STRUCTURES TO REMAIN FROM DAMAGE DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT UTILITY OWNERS OR MAKE EXPLORATORY EXCAVATIONS AS NECESSARY TO DETERMINE THE EXACT LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AND THE LIMITS AND CHARACTER OF SOIL AND/OR ROCK PRIOR TO CONSTRUCTION. IF ANY ITEM REQUIRES RELOCATION, THE CONTRACTOR SHALL NOTIFY THE OWNER OF THE ITEM WELL IN ADVANCE OF APPROACH TO THE ITEM AND SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS WITH THE OWNER AND UTILITY OWNER FOR RELOCATIONS OF THE ITEM. THE COST OF STAGING CONSTRUCTION FOR UTILITY INSTALLATION AND PROVIDING TEMPORARY SUPPORTS OR RELOCATION FOR ALL UTILITIES WITH ASSISTANCE FROM THE AFFECTED UTILITY COMPANY SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND SHALL BE PAID BY THE CONTRACTOR. NO ADDITIONAL COMPENSATION WILL BE ALLOWED.
- 3. "SCREENED" (LIGHT) DELINEATION SHOWN IN THIS SHEET DENOTES EXISTING CONDITIONS. "SCREENED" INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS AND FIELD SURVEY, IS FOR REFERENCE USE ONLY, AND SHALL BE FIELD VERIFIED PRIOR TO ORDERING OF MATERIALS AND BEGINNING CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
- 4. WASTE SITES: IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL, BROKEN CONCRETE, REMOVED EQUIPMENT, ETC) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THE PROJECT. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. EXISTING ONSITE DUMPSTER MAY NOT BE USED.
- 5. FOR ANY GROUTING OR PLUGGING WORK, THE OPENING TO BE FILLED SHALL BE THOROUGHLY WETTED AND COVERED WITH THIN CEMENT SCRUB COAT PRIOR TO PLACING GROUT/CONCRETE.
- 6. CONTRACTOR SHALL RECORD LOCATION OF REMOVAL EXTENTS OF ALL UNDERGROUND UTILITIES, LOCATION OF ALL UTILITIES ENCOUNTERED DURING CONSTRUCTION TO REMAIN, AND LOCATION OF ALL UTILITIES THAT ARE ABANDONED IN PLACE.
- 7. CONTRACTOR SHALL REMOVE ALL SITE GRANULAR SURFACING (ROCK, STONES, ETC.) PRIOR TO FINAL SURFACE RESTORATION AND PAVING.
- 8. CONTRACTOR RESPONSIBLE TO PRESERVE AND PROTECT ALL EXISTING AND PROPOSED STRUCTURES TO REMAIN DURING DEMOLITION.
- 9. REFER TO SPECIFICATION SECTION 02 4100 FOR ADDITIONAL DEMOLITION REQUIREMENTS.
- 10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXACT LOCATION AND ELEVATIONS OF ALL EXISTING UTILITIES AND STRUCTURES. ANY DAMAGE TO EXISTING UTILITIES AND STRUCTURES SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
- 11. REFER TO SPECIFICATION SECTION 01 1000 FOR SEQUENCING REQUIREMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ISOLATING PIPING AS NECESSARY TO FACILITATE REPLACEMENT, INCLUDING INSTALLING TEMPORARY BLIND FLANGES OR PANCAKE BLINDS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL ISOLATION MATERIALS REQUIRED FOR CONSTRUCTION SEQUENCING.

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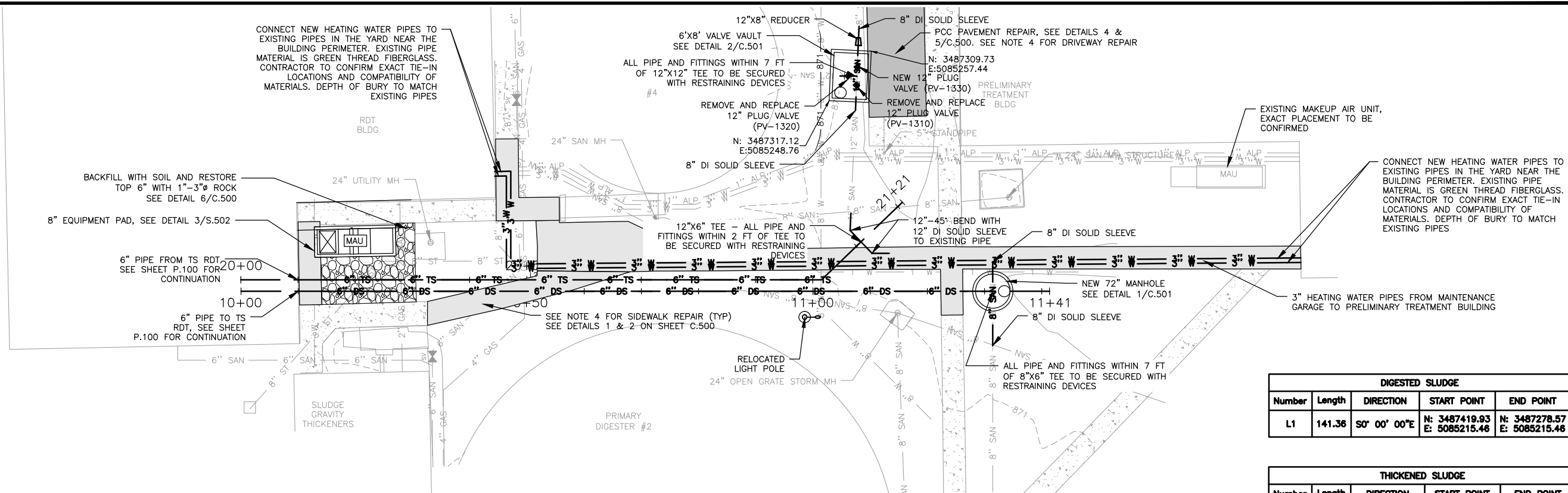
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

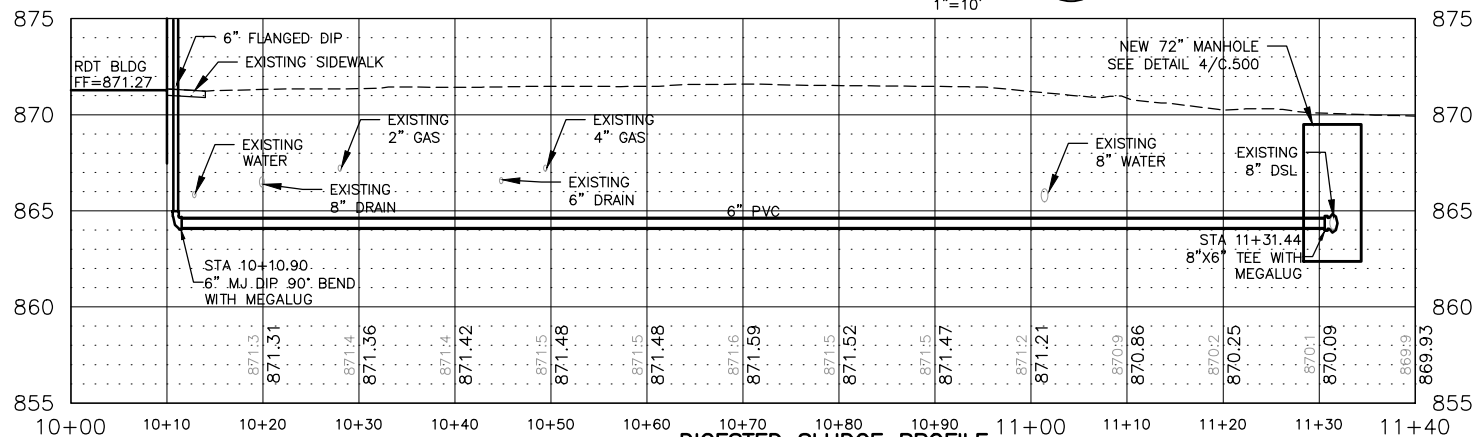
CIVIL
SITE DEMOLITION PLAN

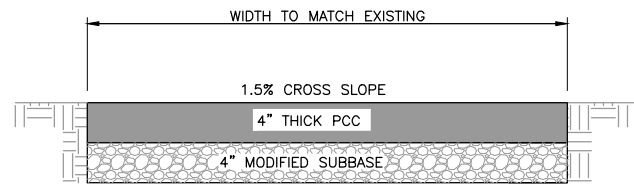
SHEET NO.
C.100



DIGESTED SLUDGE				
Number	Length	DIRECTION	START POINT	END POINT
L1	141.36	S0° 00' 00"E	N: 3487419.93 E: 5085215.46	N: 3487278.57 E: 5085215.46

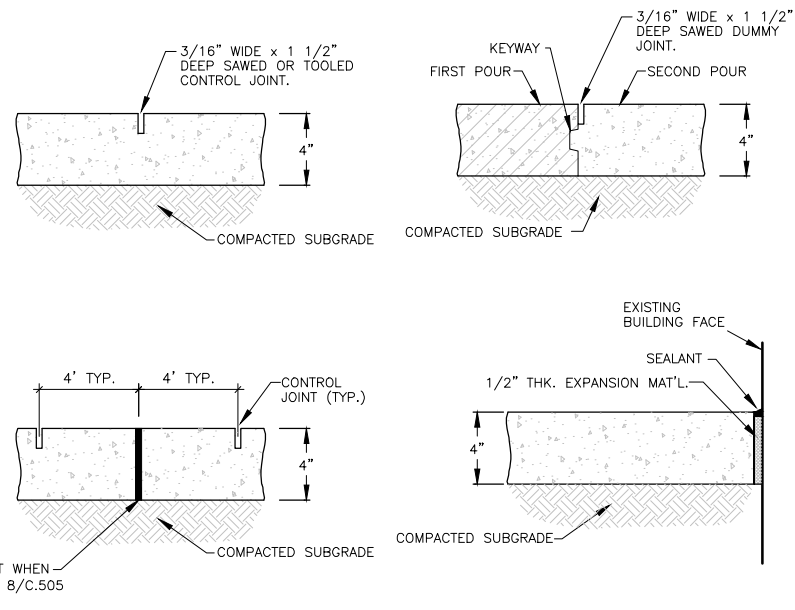
THICKENED SLUDGE				
Number	Length	DIRECTION	START POINT	END POINT
L2	101.52	S0° 00' 00"E	N: 3487419.97 E: 5085217.46	N: 3487318.46 E: 5085217.46
L3	19.59	S43° 44' 36"E	N: 3487318.46 E: 5085217.46	N: 3487304.30 E: 5085231.01



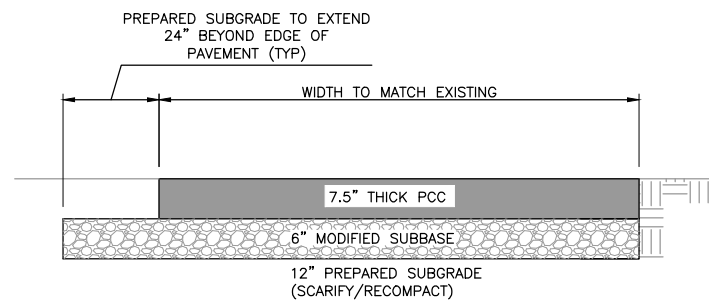


1 PCC SIDEWALK DETAIL
NTS

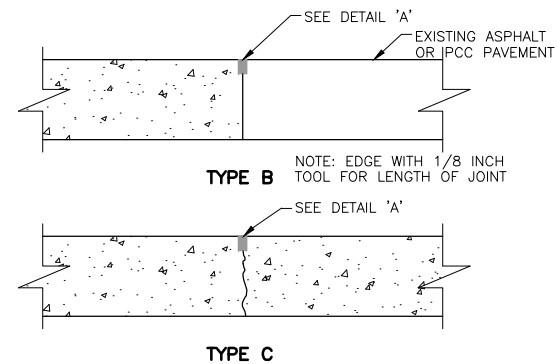
NOTE:
1. SIDEWALKS SHALL BE SLOPED TO DRAIN AND MATCH SLOPE OF ADJACENT SIDEWALK.



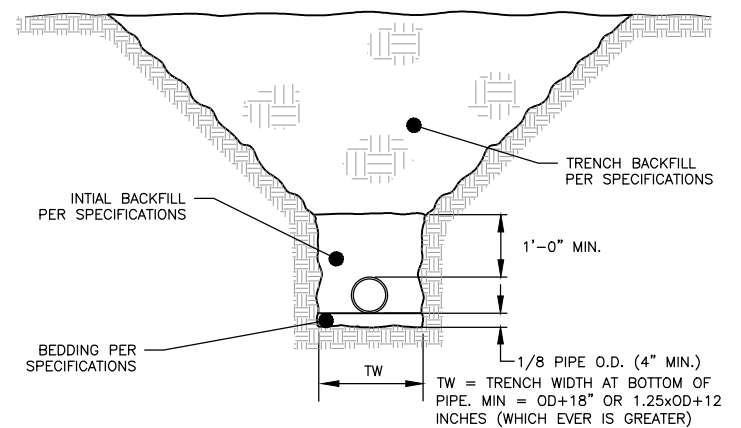
2 PCC SIDEWALK JOINT TYPES
NTS



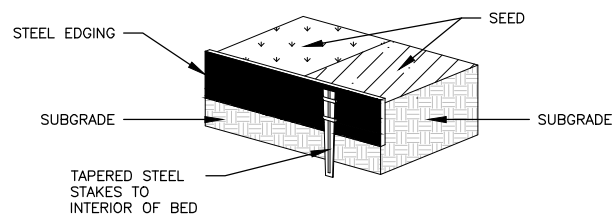
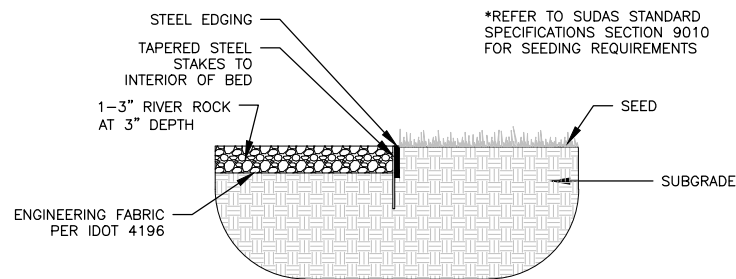
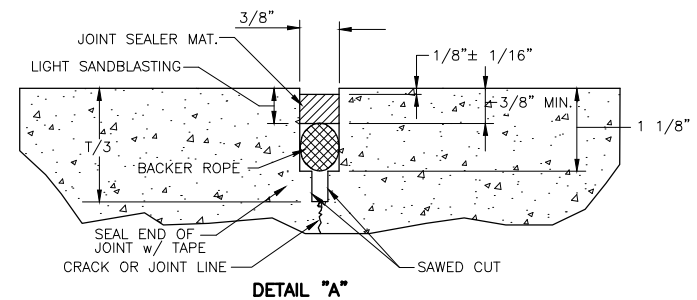
4 PCC DRIVEWAY DETAIL
NTS



5 PCC DRIVEWAY JOINT TYPES
NTS



3 TYPICAL DETAIL
PRESSURE LINES (EARTH EXCAVATION)
NTS



6 TYPICAL STEEL LANDSCAPE EDGE DETAIL
NTS

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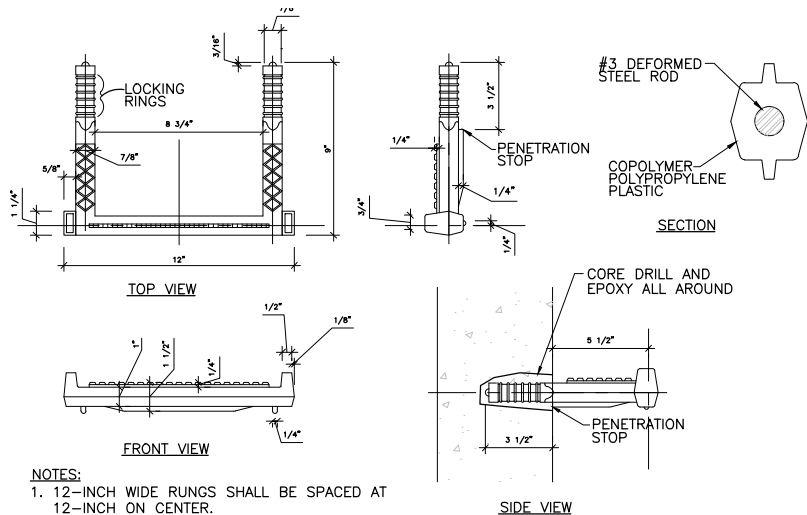
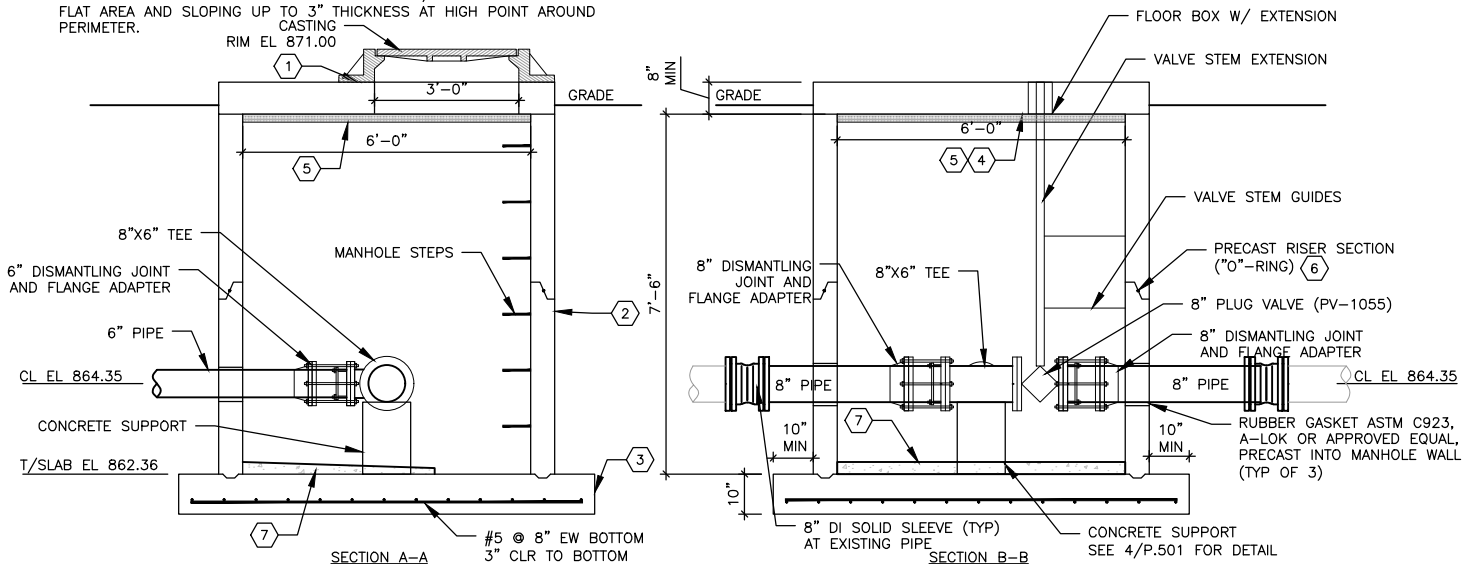
WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

CIVIL
CIVIL DETAILS

SHEET NO.
C.500

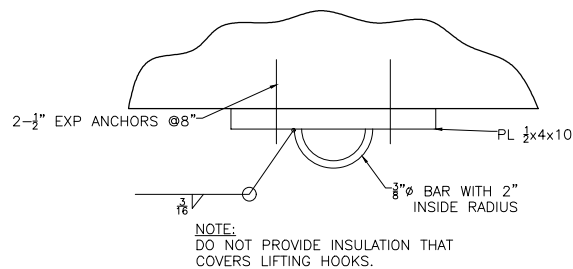
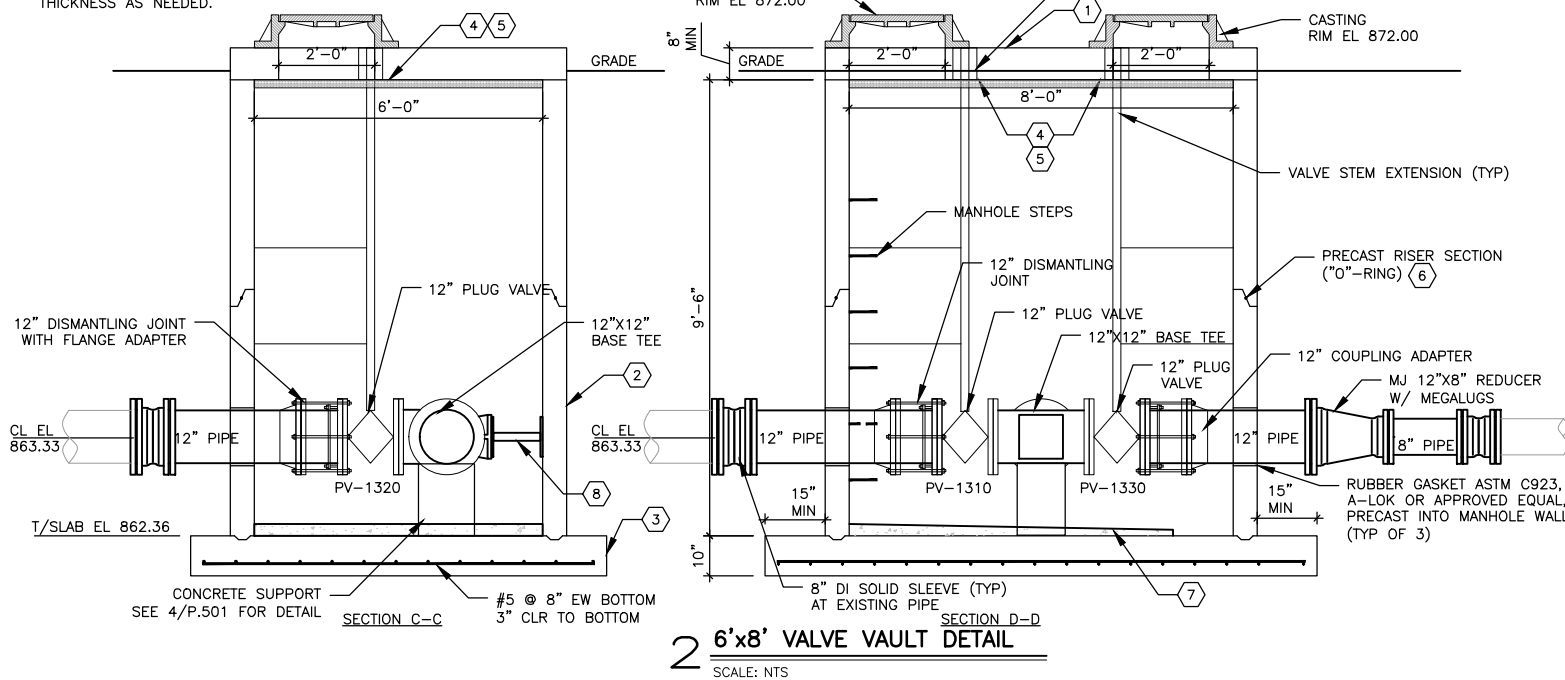
KEY NOTES: #

1. PRECAST CONCRETE TOP SLAB SUITABLE FOR HS20 WHEEL LOADING. PROVIDE IOWA PROFESSIONAL ENGINEER CERTIFICATION OF TOP SLAB WITH SHOP DRAWING SUBMITTAL. TOP SLAB DIAMETER TO MATCH OUTSIDE DIAMETER OF MANHOLE SECTION BELOW. UTILIZE EPOXY COATED REBAR. OPENING FOR MANHOLE FRAME AND COVER SHALL BE CAST INTO TOP SLAB. OPENING FOR VALVE STEM EXTENSION AND WRENCH NUT SHALL BE CAST INTO TOP SLAB. CONTRACTOR SHALL COORDINATE OPENINGS AS REQUIRED.
2. 72-INCH INSIDE DIAMETER PRECAST RISERS MEETING ASTM C478 AND SUITABLE FOR HS20 WHEEL LOADING. PROVIDE IOWA PROFESSIONAL ENGINEER CERTIFICATION OF PRECAST RISERS WITH SHOP DRAWING SUBMITTAL.
3. PRECAST CONCRETE BOTTOM SLAB SHALL BE MANUFACTURED AS SHOWN. UTILIZE EPOXY COATED REBAR.
4. INSTALL 500-POUND CAPACITY LIFT HOOK AS CLOSE AS POSSIBLE TO EACH VALVE STEM IN UNDERSIDE OF ROOF. INCLUDE LOAD IN DESIGN OF VAULT ROOF SLAB.
5. 2" POLYSTYRENE CLOSED CELL BOARD INSULATION. INSULATION MATERIAL SHALL BE APPLIED DIRECTLY TO THE MANHOLE CEILING. CONTRACTOR TO WORK INSULATION AROUND LIFT HOOKS, VALVE BOXES, AND CASTINGS. INSULATION SHALL HAVE DEMONSTRATED A SATISFACTORY PERFORMANCE HISTORY IN UNDERGROUND INSTALLATION AND SHALL HAVE THE FOLLOWING PHYSICAL PROPERTIES:
 - DENSITY-2 PCF MIN
 - COMPRESSIVE STRENGTH (ASTM D1621)
 - -35 PSI MIN
 - THERMAL CONDUCTIVITY (ASTM C177)
 - -0.23 BTU MAX HR FT² °F IN THICKNESS
6. ALL JOINTS SHALL INCLUDE CONFINED O-RING BETWEEN SECTIONS AND SHALL BE WRAPPED EXTERNALLY PER SPECIFICATION SECTION 33 0513.
7. ADD SLOPING CONCRETE FILL (2/S.501) IN BOTTOM OF MANHOLE. NO FILL IN 24"x24" AREA IMMEDIATELY BELOW ACCESS. 1 1/2" MIN THICKNESS AT EDGE OF FLAT AREA AND SLOPING UP TO 3" THICKNESS AT HIGH POINT AROUND PERIMETER.



KEY NOTES: #

1. PRECAST CONCRETE TOP SLAB SUITABLE FOR HS20 WHEEL LOADING. PROVIDE IOWA PROFESSIONAL ENGINEER CERTIFICATION OF TOP SLAB WITH SHOP DRAWING SUBMITTAL. TOP SLAB FOOTPRINT TO MATCH OUTSIDE FOOTPRINT OF RECTANGULAR VAULT SECTION BELOW. UTILIZE EPOXY COATED REBAR. OPENING FOR MANHOLE FRAME AND COVER SHALL BE CAST INTO TOP SLAB. OPENING FOR VALVE STEM EXTENSION AND WRENCH NUT SHALL BE CAST INTO TOP SLAB (TYP OF 3). CONTRACTOR SHALL COORDINATE OPENINGS AS REQUIRED.
2. 8 FOOT X 6 FOOT INSIDE DIMENSION PRECAST RISERS MEETING ASTM C478 AND SUITABLE FOR HS20 WHEEL LOADING. PROVIDE IOWA PROFESSIONAL ENGINEER CERTIFICATION OF PRECAST RISERS WITH SHOP DRAWING SUBMITTAL.
3. PRECAST CONCRETE BOTTOM SLAB SHALL BE MANUFACTURED AS SHOWN. UTILIZE EPOXY COATED REBAR.
4. INSTALL 500 POUND CAPACITY LIFT HOOK AS CLOSE AS POSSIBLE TO EACH VALVE STEM IN UNDERSIDE OF ROOF, INCLUDE LOAD IN DESIGN OF VAULT ROOF SLAB.
5. 2" POLYSTYRENE CLOSED CELL BOARD INSULATION. INSULATION SHALL BE APPLIED DIRECTLY TO THE VAULT CEILING. CONTRACTOR TO WORK INSULATION AROUND LIFT HOOKS, VALVE BOXES, AND CASTINGS. INSULATION SHALL HAVE DEMONSTRATED A SATISFACTORY PERFORMANCE HISTORY IN UNDERGROUND INSTALLATION AND SHALL HAVE THE FOLLOWING PHYSICAL PROPERTIES:
 - DENSITY-2PCF MIN
 - COMPRESSIVE STRENGTH (ASTM D1621)
 - -35 PSI MIN
 - THERMAL CONDUCTIVITY (ASTM C177)
 - -0.23 BTU MAX HR FT² °F IN THICKNESS
6. ALL JOINTS SHALL INCLUDE CONFINED O-RING BETWEEN SECTIONS AND SHALL BE WRAPPED EXTERNALLY PER SPECIFICATION SECTION 33 0513.
7. ADD SLOPING CONCRETE FILL (2/S.501) IN BOTTOM OF VAULT. NO FILL IN A 15"x15" AREA IMMEDIATELY BELOW ACCESS. 1 1/2" MIN THICKNESS AT FLAT AREA, SLOPING UP TO 3" THICKNESS AT HIGH POINT AROUND PERIMETER.
8. KICKER SHALL BE NPS 2" SCH 40 PIPE WITH 1/2"x10"x10" PLATE EACH END WITH ALL AROUND WELD TO PIPE. HOT-DIP GALVANIZE WELDED ASSEMBLY. BOLT TO BASE TEE WITH SS BOLTS AND TO PRECAST WALL WITH (4)-3/8" CONC ANCHORS PER DETAIL 4/S.501. SHIM TIGHT WITH SS 10"x10" SHIM PLATES, THICKNESS AS NEEDED.



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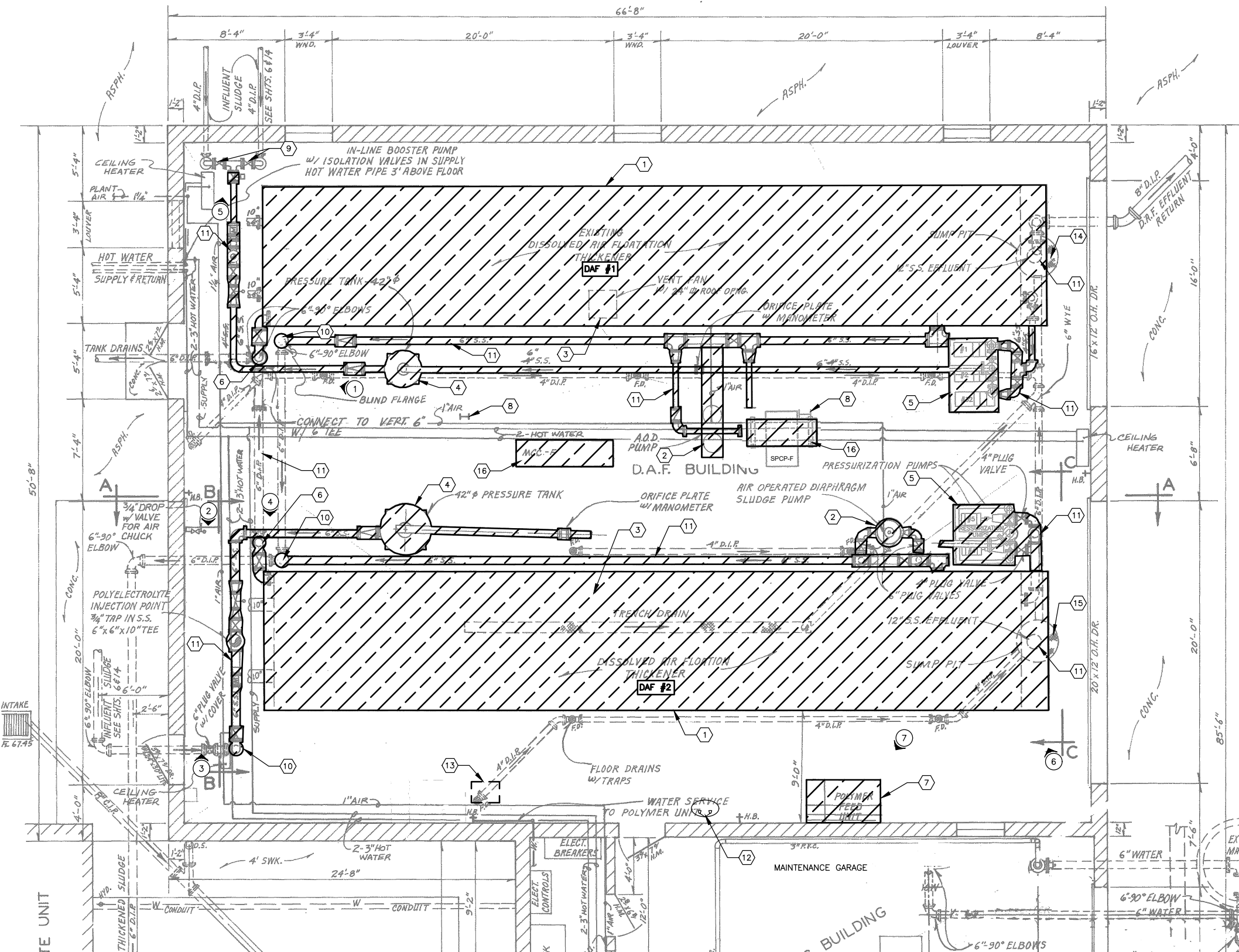
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

CIVIL
CIVIL DETAILS

SHEET NO.
C.501



1 PLAN
SCALE: 1/4"=1'-0"

GENERAL DEMOLITION NOTES:

1. "SCREENED" (LIGHT) DELINEATION SHOWN DENOTES EXISTING CONDITIONS (UNLESS NOTED OTHERWISE). "SCREENED" INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS AND FIELD SURVEY, IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT. BOLD HATCH DELINEATION REPRESENTS EXISTING ITEMS FOR DEMOLITION AND/OR CONSTRUCTION.
2. ALL DIMENSIONS AND ELEVATIONS ARE APPROXIMATE. SOME INFORMATION OMITTED FROM DRAWING FOR CLARITY. CONTRACTOR TO FIELD VERIFY ALL INFORMATION PRIOR TO STARTING WORK.
3. REFER TO SPECIFICATION SECTION 01 1000 FOR SEQUENCING REQUIREMENTS. COORDINATE REMOVALS AND SHUTDOWN OF EACH PIECE OF EQUIPMENT IN ADVANCE WITH OWNER.
4. WHERE EMBEDDED METAL OR ANCHORS ARE REMOVED, GRIND METAL DOWN TO 1/2" BELOW CONCRETE SURFACE, PAINT WITH EPOXY PAINT, AND FILL HOLE WITH SMOOTH NON-SHRINK GROUT.
5. THE OWNER SHALL HAVE FIRST SALVAGE RIGHTS TO ALL FIXTURES, DEVICES AND EQUIPMENT REMOVED. COORDINATE WITH OWNER PRIOR TO DEMOLITION.
6. REPAIR OR REPLACE BUILDING ELEMENTS WHICH ARE DAMAGED AS PART OF DEMOLITION WORK.
7. DEMOLITION DRAWINGS INDICATE MAJOR PIECES OF EQUIPMENT WHICH ARE TO BE REMOVED OR RECONNECTED. REMOVE INDICATED ITEMS AND ASSOCIATED ITEMS NOT INDICATED BUT WHICH MUST BE REMOVED TO ACCOMMODATE THE WORK. THE ITEMS INDICATED SPECIFICALLY ON THE DRAWINGS TO BE REMOVED ARE ONLY TO INDICATE IN GENERAL TO THE CONTRACTOR THE AMOUNT OF DEMOLITION WORK REQUIRED. THE CONTRACTOR SHOULD VISIT THE SITE TO DETERMINE THE EXTENT OF DEMOLITION REQUIRED AND SHOULD BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO THE BID DATE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
8. REMOVE DEMOLISHED ITEMS FROM THE PROJECT SITE. PROPERLY DISPOSE OF ITEMS.
9. EXISTING ISOLATION VALVES ARE NOT GUARANTEED TO FUNCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL ISOLATION MATERIALS REQUIRED FOR CONSTRUCTION SEQUENCING.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR ISOLATING PIPING AS NECESSARY TO FACILITATE REPLACEMENT, INCLUDING INSTALLING TEMPORARY BLIND FLANGES OR PANCAKE BLINDS.
11. SEE SHEET D.200 FOR REFERENCE PHOTOS SHOWN. #
12. CONTRACTOR SHALL COORDINATE ALL WALL AND ROOF OPENINGS AS IT RELATES TO THE WORK. CUTTING OF STRUCTURAL SUPPORT MEMBERS WILL NOT BE PERMITTED WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER. EXTENT OF CUTTING SHALL BE MINIMIZED TO PROVIDE THE NEAT MINIMUM OPENING REQUIRED. PATCHING SHALL MATCH ADJACENT MATERIALS AND SURFACES.
13. CONTENT ON THIS DRAWING IS ORIGINALLY FROM WASTE TREATMENT PLANT IMPROVEMENTS PROJECT, PHASE I, 1986, PROJECT NO. 2350. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO REMOVAL.
14. AFTER DEMOLITION OF THE NORTH DAF HAS BEEN COMPLETED, MOVE EQUIPMENT AWAY FROM THE INTERIOR WALLS AND PAINT, SEE SHEET P.100 AND SPECIFICATION SECTION 09 9000.
15. REPAIR ANY DAMAGED SLAB SURFACE PER DETAIL 4/S.500.
16. CONTRACTOR SHALL SUBMIT A PROPOSED DEMOLITION PLAN PER 02 4100 AND PROVIDE PREDEMOLITION PHOTOGRAPHS OR VIDEOTAPE PRIOR TO DEMOLITION WORK BEGINNING.

DEMOLITION KEY NOTES: #

1. REMOVE AND DISPOSE OF EXISTING DAF TANK.
2. REMOVE AND DISPOSE OF EXISTING ROTARY LOBE PUMP.
3. REMOVE AND DISPOSE OF ALL EXISTING DAF OVERHEAD DUCTWORK AND FAN. (TYP FOR BOTH EXISTING DAF UNITS)
4. REMOVE AND DISPOSE OF EXISTING PRESSURE TANK INCLUDING SUPPORTS.
5. REMOVE AND DISPOSE OF EXISTING PRESSURIZATION PUMPS INCLUDING PUMP BASES.
6. CAP AND ABANDON EXISTING SLUDGE PIPING AT FLOOR.
7. REMOVE AND DISPOSE OF EXISTING POLYMER FEED UNIT, ASSOCIATED CONCRETE SUPPORTS AND ALL ASSOCIATED PIPING.
8. PROTECT EXISTING STEEL COLUMNS, NOT ALL ARE LABELED.
9. PROTECT EXISTING PLUG VALVES, REFER TO PHOTO #5 ON SHEET D.200.
10. REMOVE EXISTING SS SLUDGE PIPING AT THE FLANGE AT FLOOR LEVEL. REFER TO PROCESS DRAWINGS FOR NEW CONNECTIONS.
11. REMOVE AND DISPOSE OF EXISTING ABOVE SLAB PIPING, SUPPORTS AND ACCESSORIES AS INDICATED.
12. PROTECT EXISTING EYEWASH STATION.
13. SAWCUT NEAT RECTANGULAR PERIMETER, MINIMUM 1" DEEP PRIOR TO REMOVING SLAB FOR PLUMBING CONNECTION. PERIMETER SHOWN IS APPROXIMATE IN SIZE AND LOCATION ONLY. EXISTING SLAB IS 6" THICK WITH 6X6 6/6 WIRE MESH, ACCORDING TO EXISTING 1980 DRAWINGS.
14. PROTECT EXISTING SUMP GRATING ASSOCIATED WITH NORTH DAF.
15. REMOVE AND SALVAGE EXISTING SUMP GRATING ASSOCIATED WITH SOUTH DAF.
16. REMOVE AND DISPOSE OF CONCRETE PAD FOR ELECTRICAL EQUIPMENT. REFER TO D.102 FOR ELECTRICAL DEMOLITION REQUIREMENTS.

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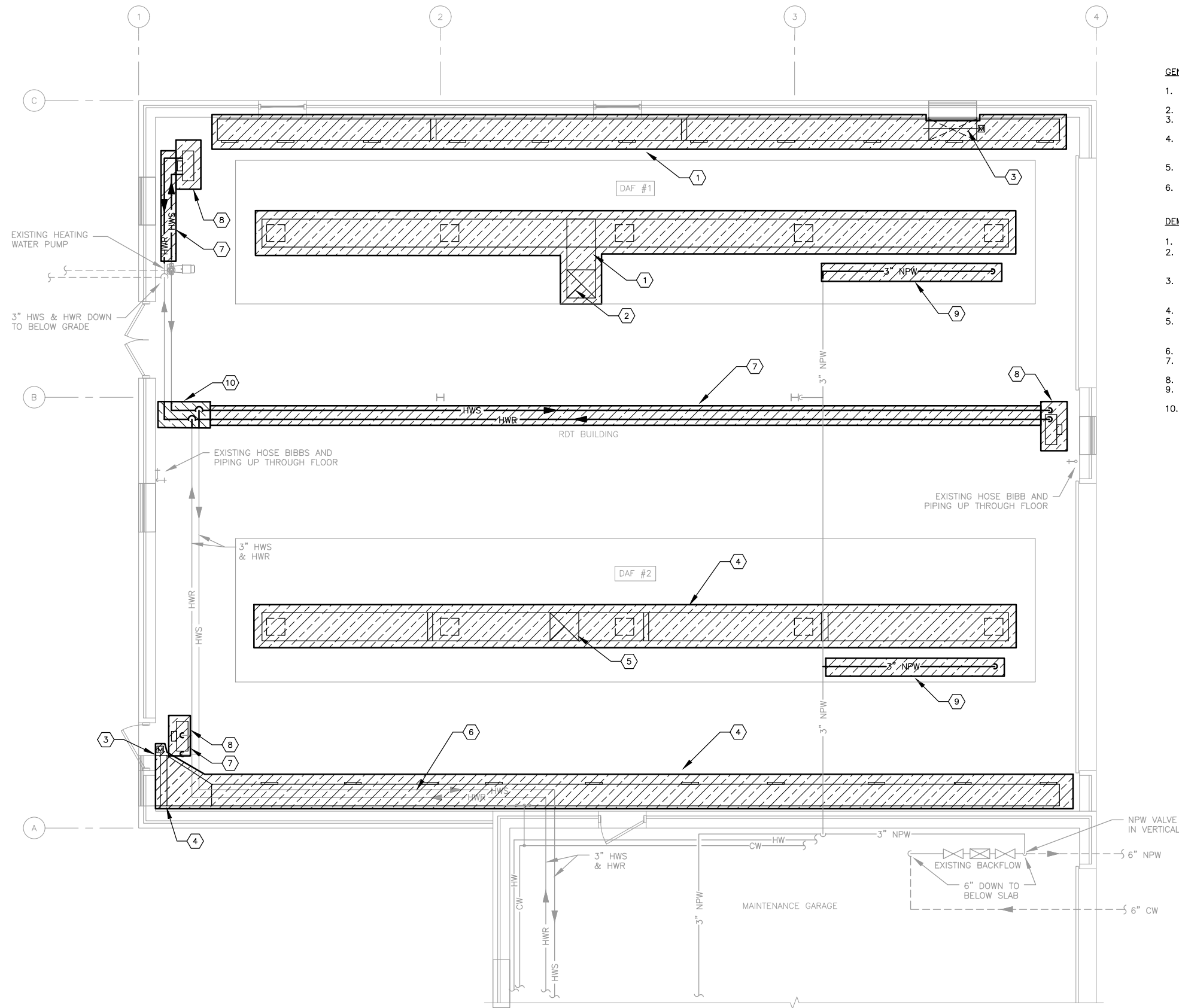
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

DEMOLITION
RDT BUILDING DEMOLITION PLAN

SHEET NO.
D.100



- GENERAL DEMOLITION NOTES:**
1. REFER TO SHEET D.100 AND SPECIFICATION SECTION 02 4100 FOR ADDITIONAL GENERAL DEMOLITION NOTES.
 2. FIELD VERIFY EXISTING CONDITIONS BEFORE DEMOLITION.
 3. COORDINATE DEMOLITION WITH OWNER BEFORE SHUTTING OFF SERVICES TO EXISTING EQUIPMENT TO REMAIN.
 4. DEMOLITION OF PIPING, DUCTWORK AND EQUIPMENT SHALL INCLUDE ALL HANGERS, SUPPORTS, ANCHORS, GUIDES, FITTINGS, VALVES, DAMPERS, ACCESSORIES, ETC.
 5. REPAIR ANY INSULATION DAMAGED DURING REMOVAL OF PIPING OR DUCT.
 6. REPAIR ANY DAMAGED SLAB SURFACE PER DETAIL 4/S.500

- DEMOLITION KEY NOTES: (#)**
1. DEMO DUCTWORK WHEN DAF #1 IS REMOVED FROM SERVICE.
 2. DEMO EXHAUST FAN ON ROOF WHEN DAF #1 IS REMOVED FROM SERVICE. PROVIDE INSULATED ROOF CAP OVER ABANDONED ROOF CURB.
 3. REMOVE MOTORIZED DAMPER AND DUCTWORK. EXISTING LOUVER SHALL REMAIN IN PLACE. SEE M.101 FOR INSULATION AND SHEET METAL PANEL ON BACK OF REMAINING LOUVER.
 4. DEMO DUCTWORK WHEN DAF #2 IS REMOVED FROM SERVICE.
 5. DEMO EXHAUST FAN ON ROOF WHEN DAF #2 IS REMOVED FROM SERVICE. PROVIDE INSULATED ROOF CAP OVER ABANDONED ROOF CURB. SEE DETAIL 6/M.500.
 6. HEATING WATER PIPING ABOVE DUCT SHALL REMAIN.
 7. DEMO HEATING WATER BRANCH PIPING SERVING UNIT HEATER. REMOVE BACK TO MAIN AND CAP.
 8. DEMO UNIT HEATER AND CONTROLS.
 9. DEMO AND CAP NPW BRANCH TO EACH EXISTING DAF AFTER DAF IS TAKEN OUT OF SERVICE.
 10. REMOVE SECTION OF PIPE SHOWN, ELBOWS AND TEES. PREPARE FOR NEW PIPING AND ELBOWS. SEE SHEET M.101.

1 MECHANICAL DEMOLITION PLAN
SCALE: 1/4" = 1'-0"



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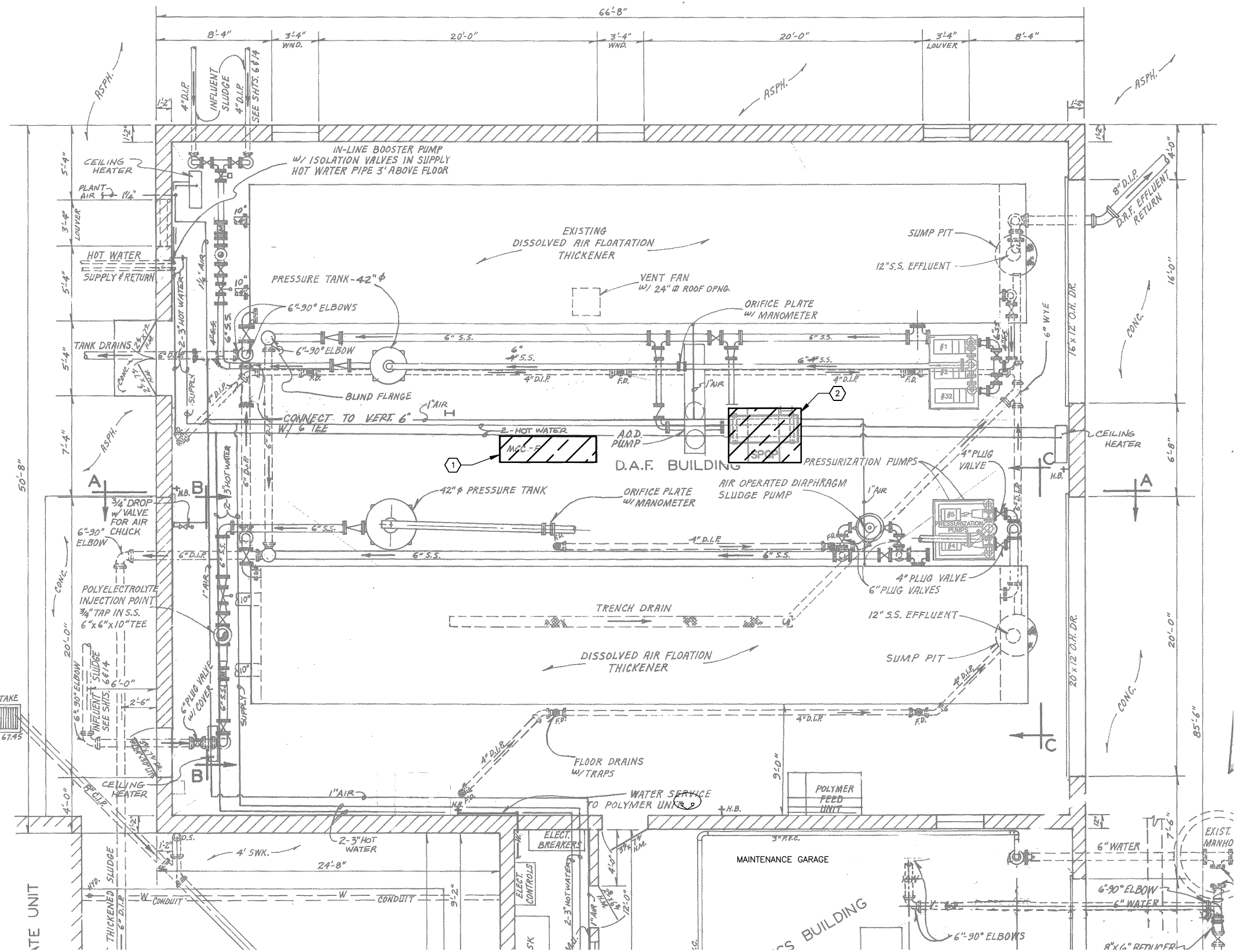
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

DEMOLITION
RDT BUILDING MECHANICAL DEMOLITION PLAN

SHEET NO.
D.101



- GENERAL DEMOLITION NOTES:
1. REFER TO SHEET D.100 AND SPECIFICATION SECTION 02 4100 FOR ADDITIONAL GENERAL DEMOLITION NOTES.
 2. CONTENT ON THIS DRAWING IS ORIGINALLY FROM WASTE TREATMENT PLANT IMPROVEMENTS PROJECT, PHASE I, 1986 PROJECT NO. 2350. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO REMOVAL.
 3. ALL EQUIPMENT AND ASSOCIATED DEVICES, CONDUIT AND WIRE DEMOLISHED SHALL BE SALVAGED TO THE OWNER. CONTRACTOR SHALL DISCARD ANYTHING THAT IS NOT WANTED.
 4. EXISTING MCC-F SHALL BE DEMOLISHED ONCE NEW MCC-F AND NEW RDT SYSTEM IS OPERATIONAL. NEW CONDUITS AND NEW MCC-F SHALL BE INSTALLED AND PREPARED FOR TRANSITION OF SERVICE. SERVICE SHALL BE TRANSITIONED OVER TO NEW MCC-F FOLLOWED BY THE DEMOLITION OF MCC-F AND ASSOCIATED CONDUITS AND CONDUCTORS TO EXISTING JUNCTION BOX. REFER TO E.100 FOR LOCATION OF NEW MCC-F AND 2/D.101 FOR LOCATION OF EXISTING JUNCTION BOX.
 5. EXISTING DAF UNITS WILL BE DEMOLISHED IN STAGES. DEMOLITION OF ASSOCIATED ELECTRICAL CONNECTION, DEVICES, CONDUIT AND WIRES SHALL BE IN ACCORDANCE WITH THE WORK SEQUENCE REQUIREMENTS OF SPECIFICATION 01 1000.
 6. REPAIR ANY DAMAGED SLAB SURFACE PER DETAIL 4/S.500

- DEMOLITION KEY NOTES: #
1. REMOVE AND DISPOSE OF EXISTING MCC-F INCLUDING CONCRETE PAD. REMOVE POWER AND CONTROL CONDUITS AND CONDUCTORS FOR EQUIPMENT BEING REMOVED. CAP CONDUITS AND CONDUCTORS FOR EXISTING EQUIPMENT AND DEVICES AND PREPARE FOR EXTENDING TO NEW MCC-F FOR CONNECTION. SEE NEW ELECTRICAL PLANS FOR LOCATION OF NEW MCC-F.
 2. REMOVE AND DISPOSE OF EXISTING SPCP-F INCLUDING CONCRETE PAD. REMOVE POWER AND CONTROL CONDUITS AND CONDUCTORS IN THEIR ENTIRETY, SEE NEW ELECTRICAL PLANS.

1 PLAN
SCALE: 1/4"=1'-0"



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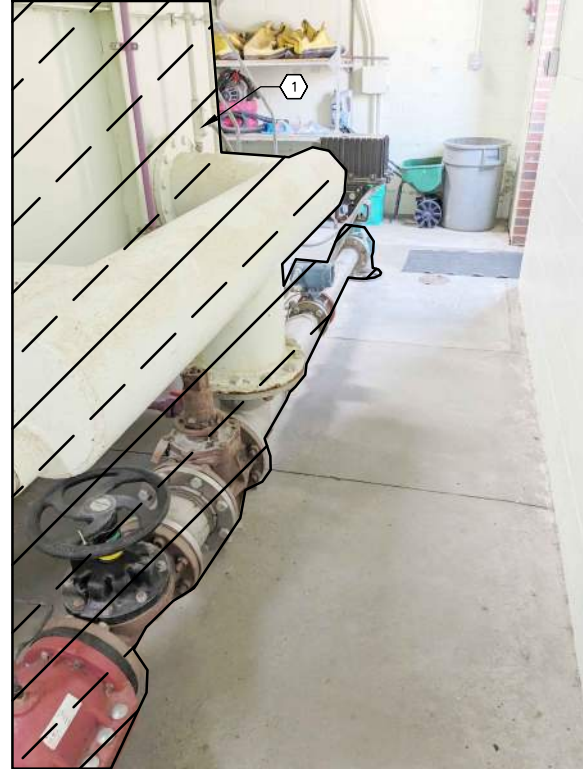
WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

DEMOLITION
RDT BUILDING ELECTRICAL DEMOLITION PLAN

SHEET NO.
D.102



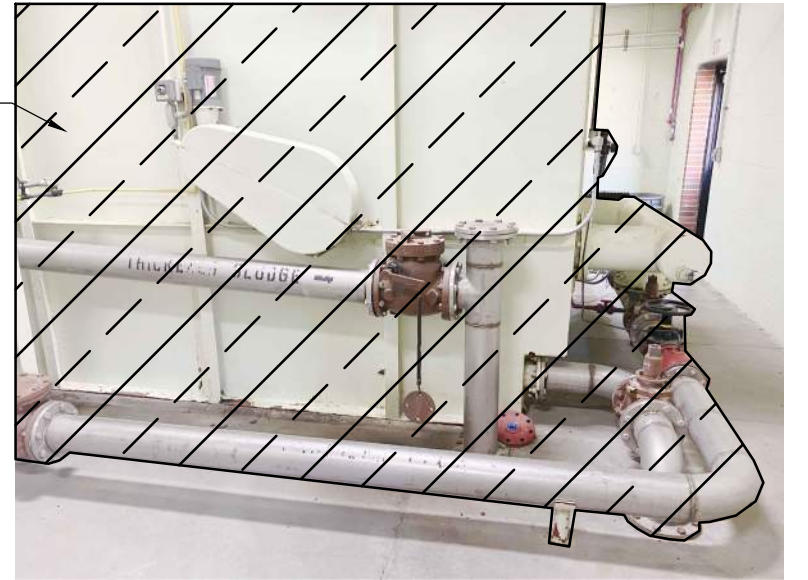
**1 NORTH DAF WEST SIDE
PIPING FACING WEST**
SCALE: NTS



**2 SOUTH DAF WEST SIDE
PIPING FACING SOUTH**
SCALE: NTS



**3 SOUTH DAF WEST SIDE
PIPING FACING NORTH**
NTS



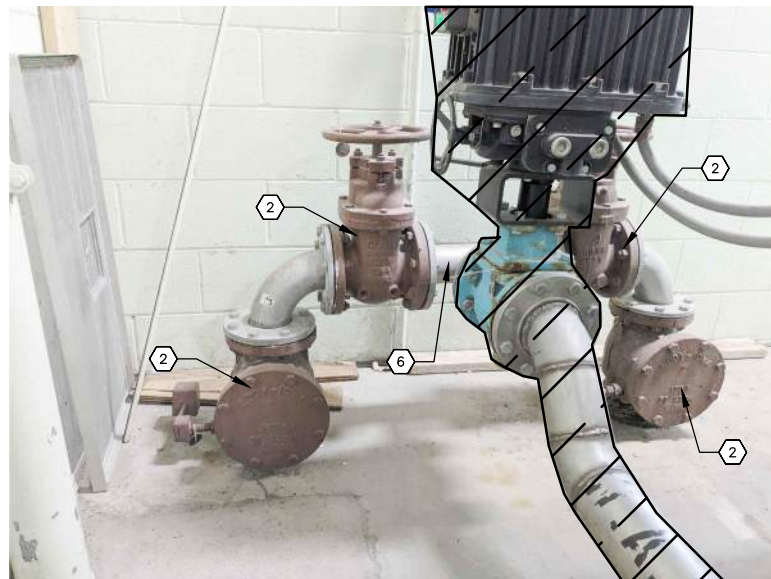
**4 SOUTH DAF WEST SIDE
PIPING FACING SOUTH**
SCALE: NTS

DEMOLITION KEY NOTES:

1. REMOVE AND DISPOSE OF EXISTING DAF TANK AND ASSOCIATED ABOVE SLAB PIPING AS INDICATED HEREIN.
2. PROTECT EXISTING VALVES.
3. REMOVE AND DISPOSE OF EXISTING POLYMER FEED UNIT, ASSOCIATED CONCRETE SUPPORTS, AND ALL ASSOCIATED PIPING.
4. PROTECT EXISTING EYEWASH STATION.
5. REMOVE AND SALVAGE EXISTING SUMP GRATING ASSOCIATED WITH SOUTH DAF.
6. EXISTING 4"x4" TEE TO BE ROTATED 90 DEGREES UP, SEE PROCESS SHEETS.

GENERAL DEMOLITION NOTES:

1. REFER TO SHEET D.100 AND SPECIFICATION SECTION 02 4100 FOR ADDITIONAL GENERAL DEMOLITION NOTES.



**5 WAS INFLUENT PIPING WITH
PLUG VALVES FACING NORTH**
SCALE: NTS



**6 SOUTH DAF EAST SIDE
PIPING FACING NORTH**
SCALE: NTS



7 POLYMER FEED SKID FACING SOUTH
SCALE: NTS

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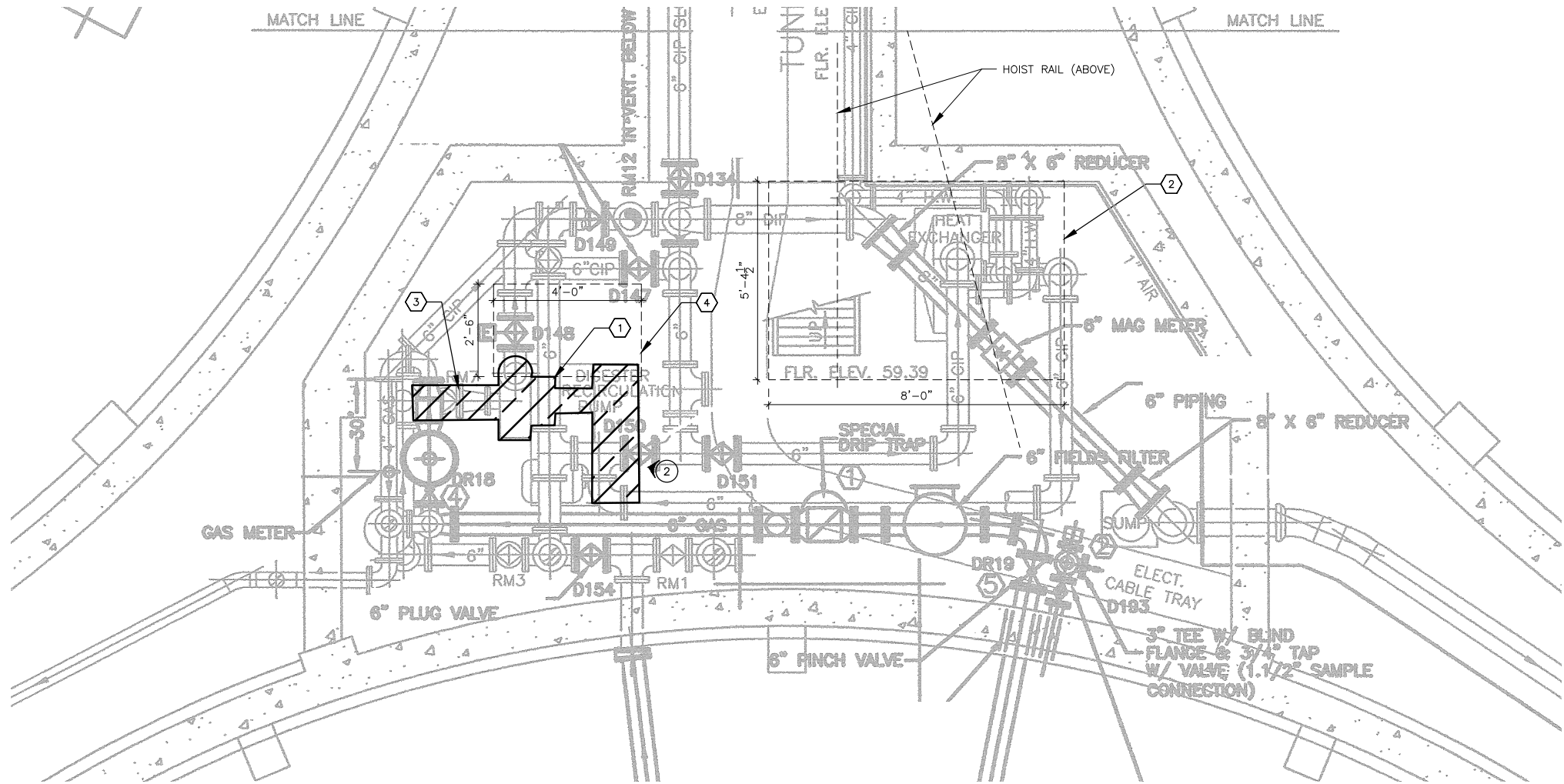
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

DEMOLITION
DEMOLITION PHOTOS

SHEET NO.
D.200



1 PLAN
SCALE: 1/2" = 1'-0"



- GENERAL DEMOLITION NOTES:
1. REFER TO SHEET D.100 AND SPECIFICATION SECTION 02 4100 FOR ADDITIONAL GENERAL DEMOLITION NOTES.
 2. CONTENT ON THIS DRAWING IS ORIGINALLY FROM WPCP BIOSOLIDS IMPROVEMENTS PROJECT, 2002, PROJECT NO. 2407-00A. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO REMOVAL.
 3. CONTRACTOR'S USE OF OWNERS 2-TON MONORAIL AND HOIST WILL BE PERMITTED. CONTRACTOR SHALL COORDINATE USE OF MONORAIL AND HOIST WITH OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ANY DAMAGES TO THE MONORAIL AND HOIST AND/OR BUILDING INFRASTRUCTURE, ETC. CAUSED BY THE CONTRACTOR'S USE OF THE MONORAIL AT NO COST TO THE OWNER.
 4. REFER TO SPECIFICATION SECTION 01 1000 FOR SEQUENCING REQUIREMENTS.

- DEMOLITION KEY NOTES: #
1. REMOVE AND DISPOSE OF EXISTING DIGESTER TRANSFER PUMP.
 2. EXTENTS OF STRUCTURAL OPENING ABOVE FOR ACCESS TO LOWER LEVEL FOR EQUIPMENT REPLACEMENT. COMBINATION OF GRATING AND SHIPS LADDER. CONTRACTOR RESPONSIBLE FOR ALL REMOVALS, RIGGING, AND STAGING TO REMOVE EXISTING PUMP AND PIPING.
 3. REMOVE AND DISPOSE OF EXISTING 6" - 90° ELBOW BELOW EXISTING SUCTION TEE. REMOVE AND DISPOSE OF EXISTING PLUG VALVE AND REDUCERS AS INDICATED. TEE WILL BE ROTATED AND PUMP SUCTION PIPING TO BE RAISED.
 4. 48"x30" OPENING ABOVE WITH GRATING.



2 DIGESTER TRANSFER PUMP AND PIPING DEMO
SCALE: NTS

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APPROVED: JPF JOB NUMBER: 2303827
CAD DATE: 1/29/2025 11:55:19 AM
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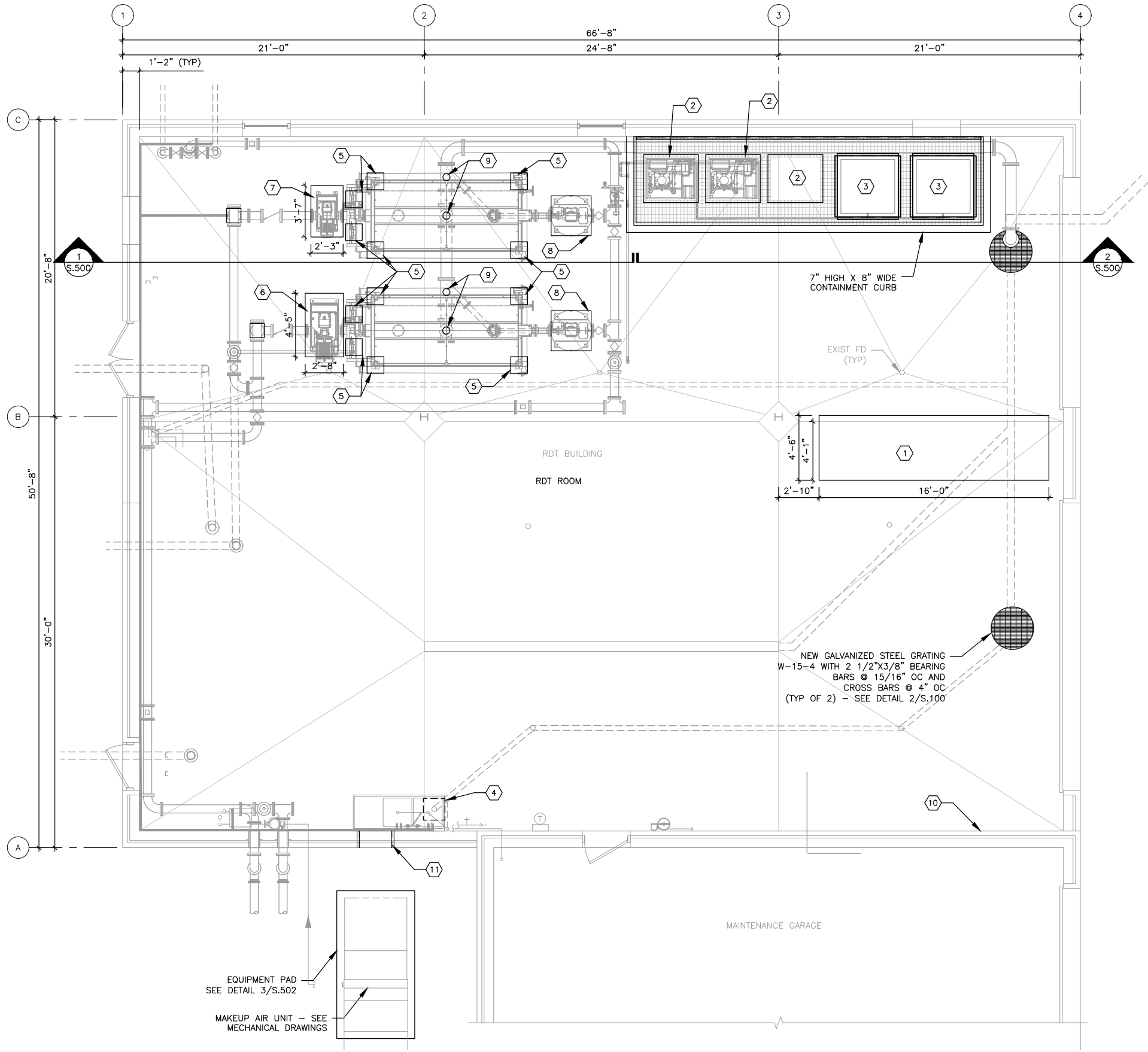
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

DEMOLITION
DIGESTER CONTROL BUILDING DEMOLITION
PLAN

SHEET NO.
D.300



1 STRUCTURAL PLAN
SCALE: 1/4"=1'-0"

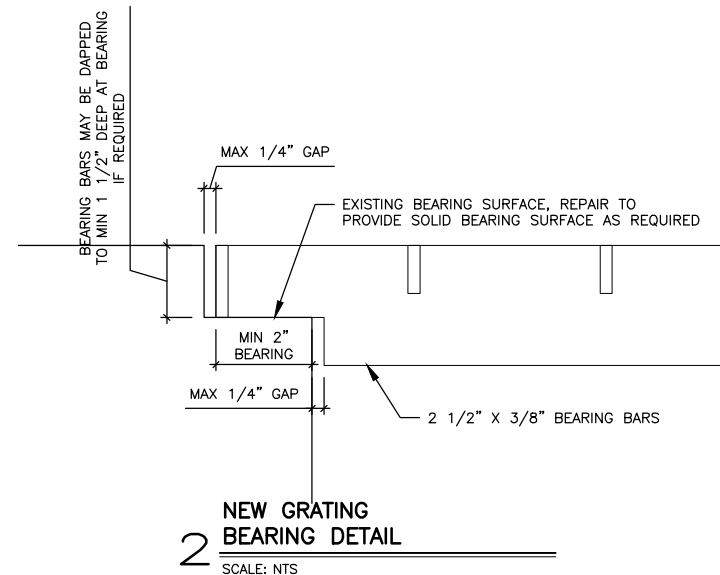


GENERAL NOTES:

- REPAIR ANY DAMAGED SLAB SURFACE PER DETAIL 4/S.500.

KEY NOTES:

- 3 1/2" TALL CONCRETE PAD FOR ELECTRICAL EQUIPMENT, SEE DETAIL 5/S.501.
- CONCRETE PAD FOR RDT POLYMER FEEDER/BLENDER, SEE ENLARGED PLAN ON S.101, SECTION ON S.500 AND DETAIL 5/S.501.
- CONCRETE PAD FOR POLYMER TOTE, SEE ENLARGED PLAN ON S.101, SECTION ON S.500 AND DETAIL 6/S.501.
- FILL FLOOR OPENING WITH CONCRETE AND FINISH TO MATCH SURROUNDING CONCRETE FLOOR.
- 12" SQUARE CONCRETE SUPPORT PIER SHALL BE CENTERED UNDER EACH LEG OF EQUIPMENT. TYP OF 12, REFER TO SHEET S.500.
- 6" TALL CONCRETE PAD FOR TS PUMP, SEE DETAIL 5/S.501. CONTRACTOR TO COORDINATE PAD LOCATION WITH PROCS PIPING CONNECTION TO RDT.
- 9 7/8" TALL CONCRETE PAD FOR TWAS PUMP, SEE DETAIL 6/S.501. CONTRACTOR TO COORDINATE PAD LOCATION WITH PROCS PIPING CONNECTION TO RDT.
- 2'-10" SQUARE CONCRETE PAD SHALL BE CENTERED UNDER LEGS OF EQUIPMENT (TYP OF 2). REFER TO SHEET S.500 AND DETAIL 6/S.501.
- PIPE SUPPORT SEE DETAIL 4/P.501.
- INSTALL PERMANENT LAMINATED PLASTIC SIGN WITH MINIMUM 3" LETTERS: "GRATING DESIGNED FOR H20 WHEEL LOAD OR 3-TON FORKLIFT DO NOT EXCEED CAPACITY".
- WELDED RECTANGULAR WALL SLEEVE FOR HVAC DUCT - SEE M-SHEETS FOR LOCATION. FABRICATE FROM 1/4"x1'-2" STEEL PLATE - ALL WELDED AND HOT DIPPED GALVANIZED AFTER FABRICATION. REPAIR CMU AND BRICKWORK AS REQUIRED AFTER INSTALLATION OF SLEEVE.



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APPROVED: JPF JOB NUMBER: 2303827
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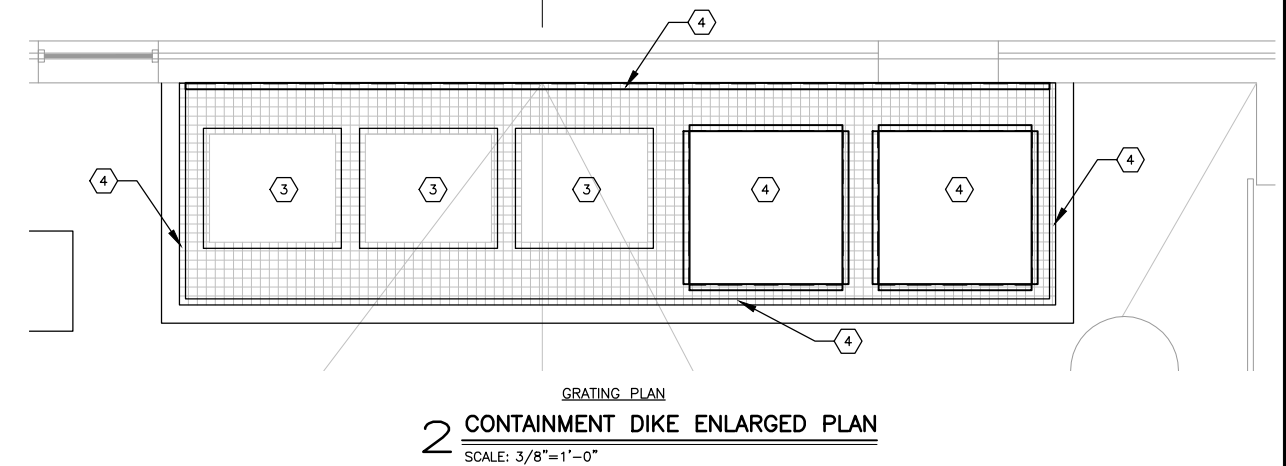
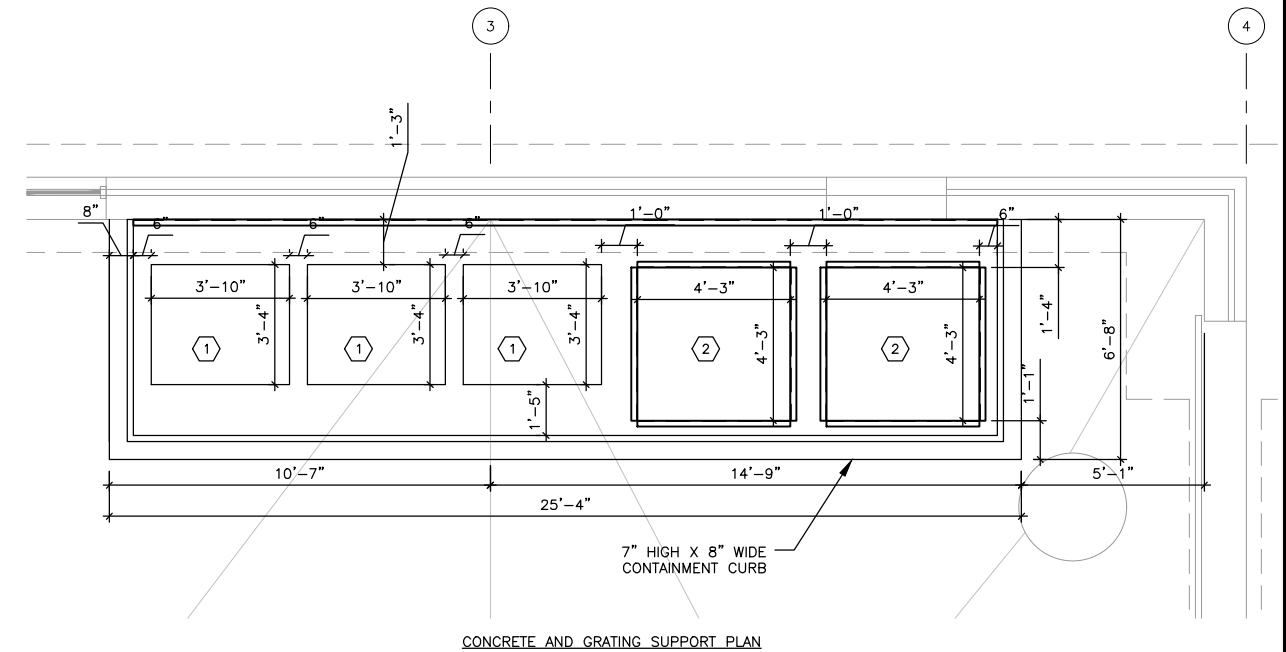
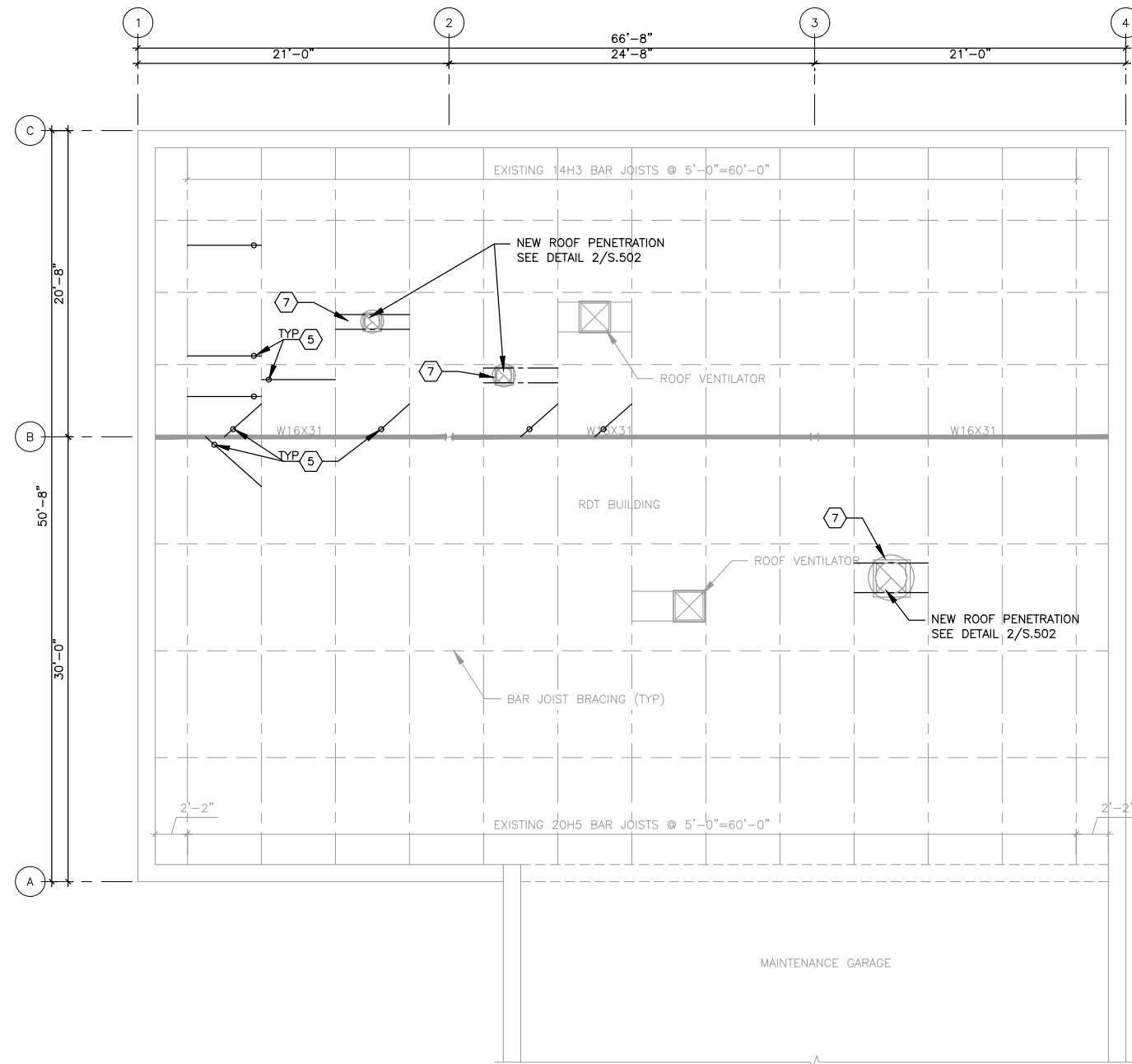
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

STRUCTURAL
STRUCTURAL PLAN

SHEET NO.
S.100

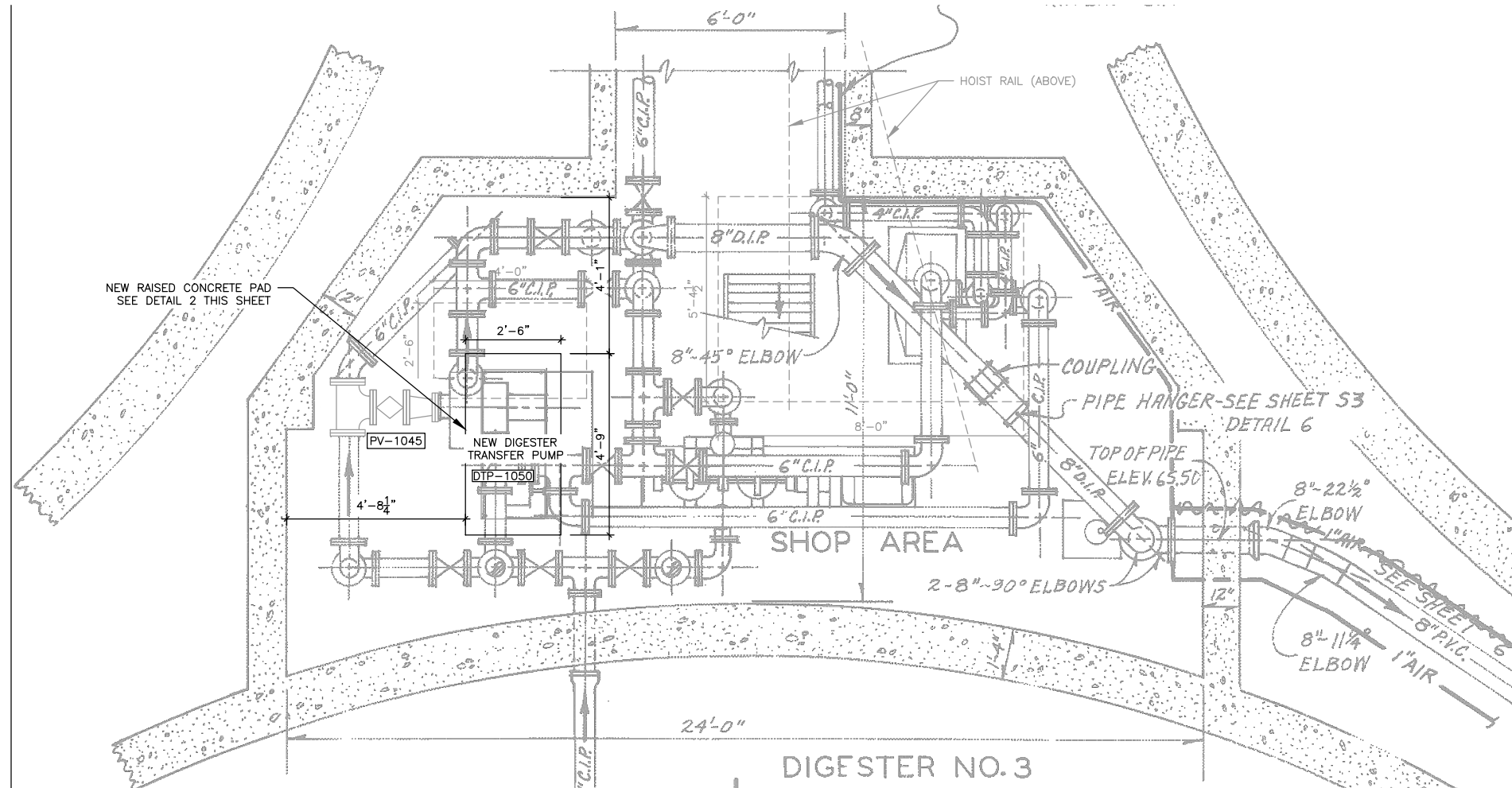


GENERAL NOTES:

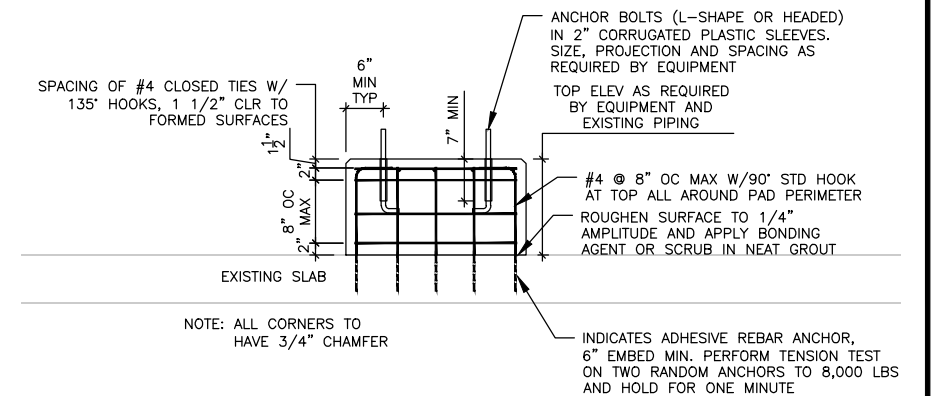
1. CONTENT ON THIS DRAWING IS ORIGINALLY FROM DISSOLVED AIR FLOTATION AND SLUDGE VEHICLE STORAGE BUILDING PROJECT, 1980, PROJECT NUMBER 2320. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.

KEY NOTES:

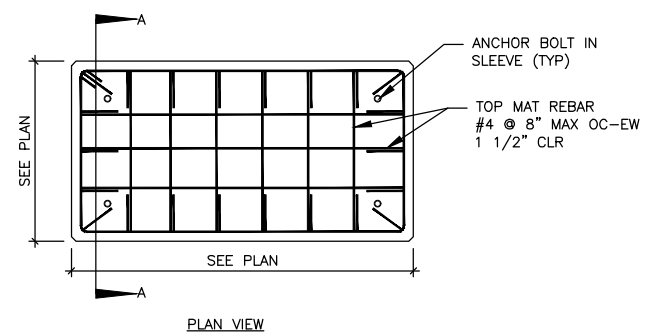
1. CONCRETE PAD FOR RDT POLYMER FEEDER/BLENDER, SEE SECTION ON S.500 AND DETAIL 5/S.501.
2. CONCRETE PAD FOR POLYMER TOTE, SEE SECTION ON S.500 AND DETAIL 6/S.501.
3. GRATING BEARS 2" ON CONCRETE EQUIPMENT PAD.
4. GRATING SUPPORTED BY BOLT-ON ANGLE OR EMBEDDED ANGLE - SEE DETAIL 1/S.502.
5. SS LIGHT GAUGE STRUT SPANNING FROM EXISTING ROOF JOIST PANEL POINT TO EXISTING W16 (SEE SPECIFICATION SECTION 22 0529). DESIGN FOR 400 LB POINT LOAD FROM PIPING (TYP 9 LOCATIONS).
6. APPROXIMATE LOCATION OF PIPE SUPPORT - COORDINATE WITH P-SHEETS FOR LOCATIONS (TYP OF 9).
7. CONTRACTOR TO INSTALL ROOF CRICKETS TO DRAIN WATER AROUND NEW MECHANICAL CURBS. CRICKETS SHALL BE CONSTRUCTED OF TAPERED INSULATION WITH MATERIAL TO MATCH EXISTING ROOF SYSTEM.



1 DIGESTER CONTROL BUILDING PLAN
SCALE: 1/2" = 1'-0"



SECTION A-A



2 RAISED CONCRETE PAD DETAIL
SCALE: NTS

GENERAL NOTES:

- BACKGROUND CONTENT ON THIS DRAWING IS ORIGINALLY FROM WPCP BIOSOLIDS IMPROVEMENTS PROJECT, 2002, PROJECT NUMBER 2407-00A. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO BEGINNING WORK.

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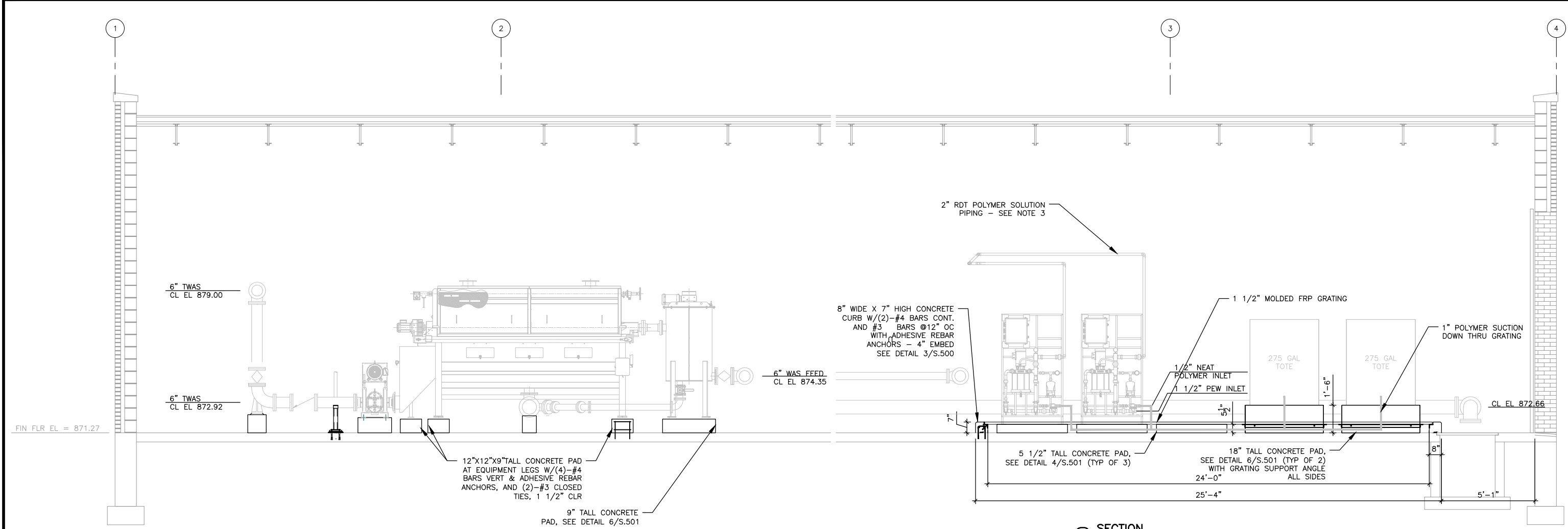


WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

STRUCTURAL
DIGESTER CONTROL BUILDING PLAN

SHEET NO.
S.300

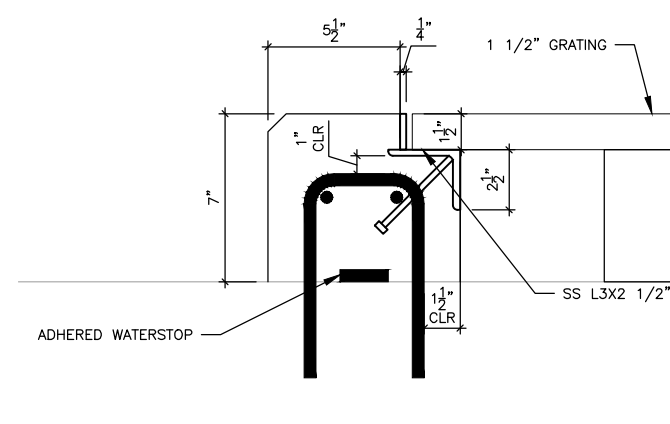
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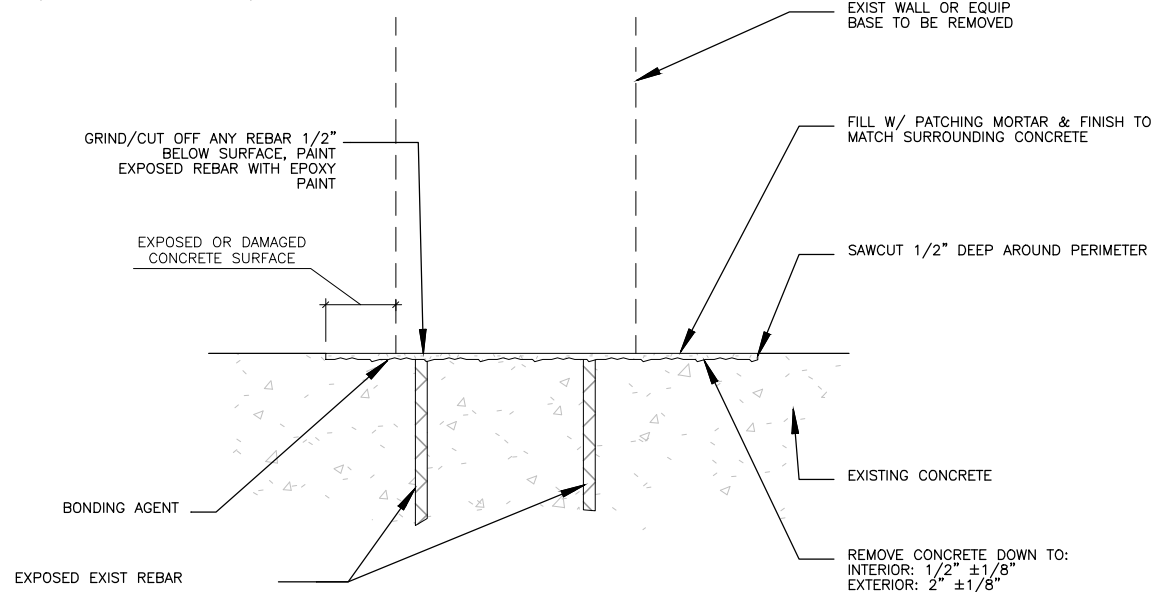
1 SECTION
SCALE: 3/8"=1'-0"

2 SECTION
SCALE: 3/8"=1'-0"

- NOTES:**
- 1. HEIGHTS OF ALL CURBS AND EQUIPMENT PADS ARE RELATIVE TO HIGH POINT OF FLOOR (EL 871.27'±)
 - 2. HEIGHTS SHOWN ARE APPROXIMATE. COORDINATE ACTUAL HEIGHT WITH REQUIREMENTS OF PROCESS EQUIPMENT.



3 CURB DETAIL
SCALE: NTS



4 CONCRETE REPAIR DETAIL
SCALE: NTS

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JOB DATE: 2025
JOB NUMBER: 2303827

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0 1"

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NO.	DATE	BY	REVISION DESCRIPTION



WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

STRUCTURAL
STRUCTURAL SECTIONS & DETAILS

SHEET NO.
S.500

Xrefs: xgl-1-dm01: XXX-0-S01: XP-1-S01

REINFORCING LAP SPLICE TABLE — 4,000 PSI CONCRETE						
BAR SIZE	CONDITION 1		CONDITION 2		CONDITION 3	HOOKS STD 90 DEGREE HOOK LENGTH
	CLEAR COVER >= 2 DIA AND CC SPACING >= 5 DIA		CLEAR COVER >= 1 DIA AND CC SPACING >= 3 DIA			
	TOP	OTHER	TOP	OTHER	ALL BARS	
#3	1' — 4"	1' — 4"	2' — 0"	1' — 6"	SEE NOTE 3	0' — 6"
#4	1' — 7"	1' — 4"	2' — 8"	2' — 1"		0' — 8"
#5	2' — 0"	1' — 6"	3' — 4"	2' — 8"		0' — 10"
#6	2' — 6"	1' — 10"	4' — 0"	3' — 1"		1' — 0"
#7	3' — 6"	2' — 9"	5' — 10"	4' — 7"		1' — 2"
#8	4' — 0"	3' — 1"	6' — 8"	5' — 2"		1' — 4"
#9	4' — 6"	3' — 6"	7' — 7"	5' — 10"		1' — 7"
#10	5' — 1"	3' — 11"	8' — 6"	6' — 6"		1' — 10"
#11	5' — 8"	4' — 4"	9' — 5"	7' — 4"		2' — 0"

- DETAIL NOTES
- LAP ALL BARS PER THIS SCHEDULE UNLESS NOTED OTHERWISE.
 - BAR COVER AND SPACING MUST BOTH MEET THE CRITERIA OF CONDITION 1 OR 2 IN ORDER TO USE THAT PARTICULAR LAP LENGTH.
 - TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.
 - FOR BARS THAT DO NOT SATISFY EITHER CONDITION, LAP LENGTH SHALL BE THE LENGTH FROM THE APPROPRIATE CATEGORY ("TOP" OR "OTHER") OF CONDITION 2 MULTIPLIED BY 1.5.
 - FOR EPOXY-COATED BARS, MULTIPLY FINAL LAP LENGTH BY 1.5.
 - NON-CONTACT LAP SPLICE LENGTH IS THE LAP SPLICE PLUS THE SEPARATION OF BARS BEING LAPPED. BARS BEING LAPPED CANNOT BE FURTHER APART THAN 1/5TH OF THE LAP SPLICE LENGTH OR 6 INCHES, WHICHEVER IS SMALLER.
 - CLEAR COVER IS DISTANCE FROM FACE OF CONCRETE TO FACE OF BAR.

1 CONCRETE REINFORCING LAP SPLICE TABLE

SCALE: NTS

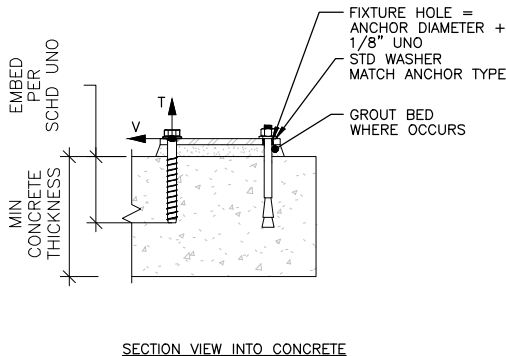
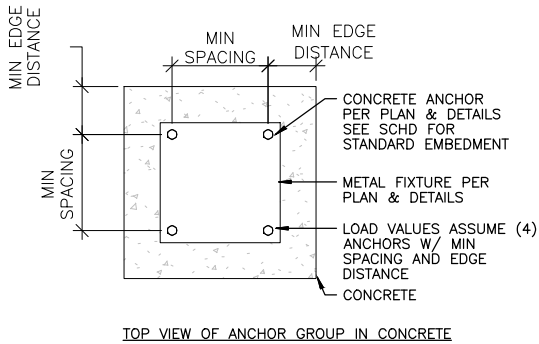
STANDARD CONCRETE ANCHORS							
ANCHOR DIAMETER	3/8"	1/2"	5/8"	3/4"	7/8"	1"	
STANDARD MECHANICAL ANCHOR EMBED, UNO (NOTE 1)	3 1/4"	3 1/2"	4 1/2"	5 1/2"	N/A	N/A	
STANDARD ADHESIVE ANCHOR EMBED, UNO (NOTE 1)	3 1/4"	4"	5"	6"	8"	10"	
MINIMUM SPACING	4"	6"	8"	9"	12"	16"	
MINIMUM EDGE DISTANCE	4"	4"	5"	8"	12"	16"	
MINIMUM CONCRETE THICKNESS	5"	6"	8"	10"	12"	14"	
ALLOWABLE TENSION "T" (LB)	750*	1,100*	1,450*	2,350*	5,200*	7,800*	
ALLOWABLE SHEAR "V" (LB)	300*	400*	625*	1,150*	1,950*	3,250*	

* LOADS ONLY APPLICABLE TO INSTALLATION INTO CRACKED CONCRETE
4,000 ≤ F_c ≤ 8,000 PSI MEETING MINIMUM EMBED, SPACING, AND EDGE DISTANCES SHOWN. LOADS FOR SINGLE ANCHOR ,OUT OF THE GROUP BELOW, WITH SERVICE LEVEL (ASD) LOADING.

- DETAIL NOTES
- ALL ANCHORS SHALL RECEIVE STANDARD EMBED, SPACING, EDGE DISTANCE, CONCRETE THICKNESS, AND LOAD CONDITIONS, UNLESS NOTED OTHERWISE ON "S" SHEETS. UNLESS NOTED OTHERWISE, MINIMUM EMBEDMENT SHALL BE PER TABLE ABOVE. IN NO CASE MAY THE EMBEDMENT BE LESS THAN THE MANUFACTURER'S "MINIMUM EMBEDMENT" FROM PUBLISHED CATALOG LITERATURE.
 - CONTRACTOR SHALL USE BASIS OF DESIGN ANCHORS OR SUBMIT ENGINEERED ANCHORS MEETING REQUIREMENTS OF ACI 355.2 & APPLICABLE TO EDGE AND SPACING REQUIREMENTS OF THE CONTRACT DOCUMENTS FOR APPROVAL. BASIS OF DESIGN ANCHORS INCLUDE:
 - SCREW: HILTI KH-EZ SS316 AND MKT SUP-R-BOLT 316SS
 - EXPANSION: HILTI KWIK BOLT 3 OR KWIK BOLT T22; DEWALT POWER-STUD+ SD6 AND SIMPSON STRONG-BOLT 2
 - ADHESIVE HILTI RE-500-V3 OR HY200-V3; ITW RED HEAD C6+; SIMPSON SET-3G; DEWALT PURE 200+WHERE DRAWINGS CALL FOR CONCRETE ANCHORS, CONTRACTOR MAY CHOOSE BETWEEN EXPANSION, SCREW OR ADHESIVE ANCHOR. WHERE DRAWINGS CALL FOR MECH ANCHOR, CONTRACTOR MAY CHOOSE BETWEEN EXPANSION AND SCREW ANCHOR.
 - INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S PUBLISHED RECOMMENDATIONS AND ADDITIONAL RECOMMENDATIONS OF ICC EVALUATION SERVICE REPORT.
 - ALL CONCRETE ANCHORS MUST BE INSPECTED TWICE:
 - AFTER HOLE IS DRILLED AND CLEANED, AND
 - DURING INSTALLATION OF ADHESIVE AND/OR MECHANICAL ANCHOR.
 - ON DRAWINGS, ADHESIVE ANCHORS MAY ALSO BE REFERRED TO AS EPOXY OR EPOXY SET ANCHORS.
 - FOR ANCHORS RESISTING TENSION AND SHEAR USE FOLLOWING EQUATION: (ACTUAL TENSION/ALLOWABLE TENSION) + (ACTUAL SHEAR / ALLOWABLE SHEAR) <1.00
 - ADHESIVE ANCHORS MAY NOT BE USED IN OVERHEAD APPLICATIONS UNLESS NOTED OTHERWISE ON THE "S" SHEETS.
 - ANY ADHESIVE ANCHOR IN CONSTANT TENSION OR INSTALLED IN ANY ORIENTATION BETWEEN HORIZONTAL AND OVERHEAD VERTICAL MUST BE INSTALLED AND INSPECTED BY CERTIFIED INSTALLER / INSPECTOR. SEE DIVISION 5 SPECIFICATIONS.
 - ALL CONCRETE ANCHORS SHALL BE STAINLESS STEEL TYPE 316 UNO.
 - DO NOT INSTALL ADHESIVE ANCHORS IN CONCRETE LESS THAN 21 DAYS OLD.

4 ANCHORAGE TO CONCRETE

SCALE: NTS

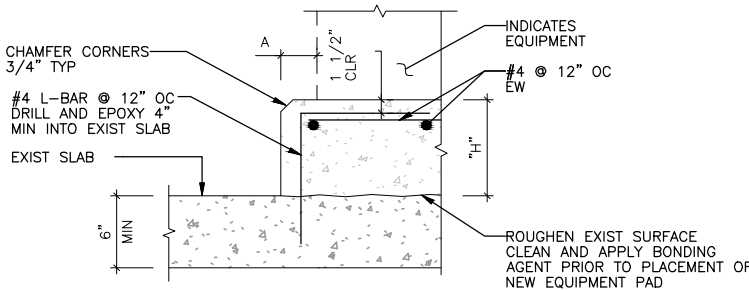


CONCRETE MATERIAL SCHEDULE	
PROJECT USE	MIX 1 BLDG CONCRETE
PROPERTIES/MATERIALS	
COMPRESSIVE STRENGTH — MINIMUM	4,500 psi
PORTLAND CEMENT — ASTM C150	TYPE I OR TYPE II
FLYASH — ASTM C618 (CLASS C OR F)	15% MAX
AGGREGATE — COARSE — ASTM C33	3/4" MAX
AIR ENTRAINMENT — ASTM C260	6% ± 1%
SUPER PLASTICIZER — ASTM C494	(OPTIONAL) TYPE F
WATER TO CEMENT RATIO — MAXIMUM	0.45 MAX
SYNTHETIC FIBERS	YES
SLUMP	3" ± 1"
WATERPROOFING	N/A

- DETAIL NOTES
- ALL CONCRETE IS MIX 1 UNLESS NOTED OTHERWISE.
 - TOPPING SLABS SHALL BE 2" MIN THICKNESS, MIX 1, BUT WITH MAX 1/2" AGGREGATE.
 - LIMIT AIR CONTENT OF STEEL-TROWELED FLOORS TO 3% MAX.

2 CONCRETE MATERIAL SCHEDULE

SCALE: NTS



- DETAIL NOTES
- "H" TO BE DETERMINED BY MOUNTING HEIGHT OF EQUIPMENT.
 - "H" SHALL NOT BE LESS THAN 3 1/2" OR GREATER THAN 8" WITHOUT ENGINEERS APPROVAL.
 - PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER. SETBACK DIMENSION "A" SHALL BE 2" AT ELECTRICAL EQUIPMENT AND 3" AT OTHER EQUIPMENT.
 - THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER, AND SHALL BE HELD IN POSITION WITH A ONE PIECE TEMPLATE, MATCHING THE BASE PLATE, WHILE PAD IS BEING POURED.
 - EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS SPECIFIED OTHERWISE.
 - WHEN ANCHORAGE OF EQUIPMENT TO SLAB IS REQUIRED, USE SPECIFIED STAINLESS STEEL WEDGE ANCHORS.

5 EQUIPMENT PAD AT EXISTING SLAB

SCALE: NTS

BAR SIZE	EMBEDMENT (UNO) (IN)
3	3 1/2
4	4 1/2
5	5 1/2
6	7

7 ADHESIVE REBAR ANCHORS

SCALE: NTS

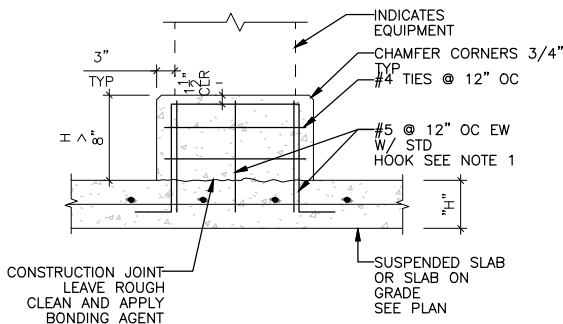
NOTE: USE ADHESIVE PRODUCT FROM DETAIL 4/S.501

CONCRETE PROTECTION FOR REINFORCEMENT CONCRETE CLEAR COVER DIMENSIONS	
UNLESS NOTED OTHERWISE	
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3"
CONCRETE IN CONTACT WITH OR IMMEDIATELY ABOVE OR ADJACENT TO WATER/WASTEWATER	2"
CONCRETE EXPOSED TO EARTH OR WEATHER	
#6 THROUGH #11 BARS	2"
#5 AND SMALLER, W31 OR D31 WIRE	1 1/2"
CONCRETE NOT EXPOSED TO WEATHER, CONTACT WITH GROUND, OR WASTEWATER	
SLABS, WALLS, AND JOISTS: #11 AND LARGER BARS	1 1/2"
#10 AND SMALLER BARS	LARGER OF 1" OR BAR DIA.
BEAMS AND COLUMNS: PRIMARY REINFORCEMENT, TIES, STIRRUPS AND SPIRALS	1 1/2"

- DETAIL NOTES
- SEE SPECIFICATIONS OR GENERAL NOTES FOR TOLERANCES.
 - CLEAR COVER IS DISTANCE FROM FACE OF CONCRETE TO FACE OF BAR.

3 CONCRETE COVER REQUIREMENTS

SCALE: NTS



- DETAIL NOTES
- CONTRACTOR MAY USE ADHESIVE REBAR ANCHORS IN LIEU OF HOOKED BAR WHERE "H" IS 12" OR GREATER, WITH ENGINEERS APPROVAL.
 - SEE 5/S.501 FOR ADDITIONAL INFORMATION.

6 EQUIPMENT PAD GREATER THAN 8 INCHES

SCALE: NTS

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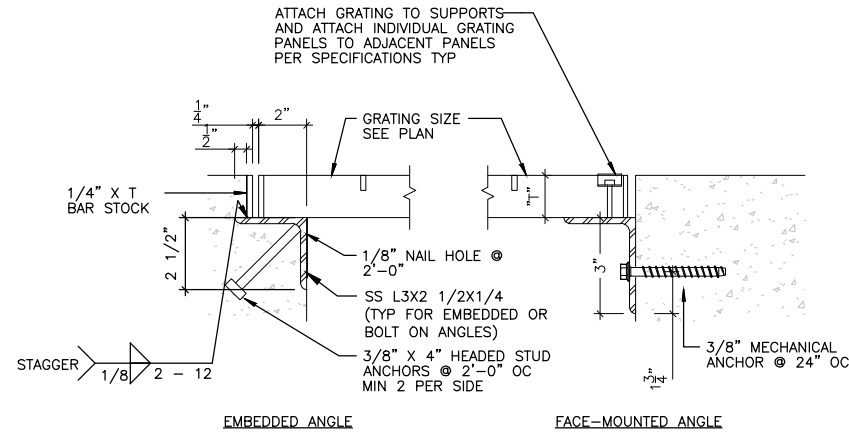
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

STRUCTURAL
TYPICAL CONCRETE DETAILS

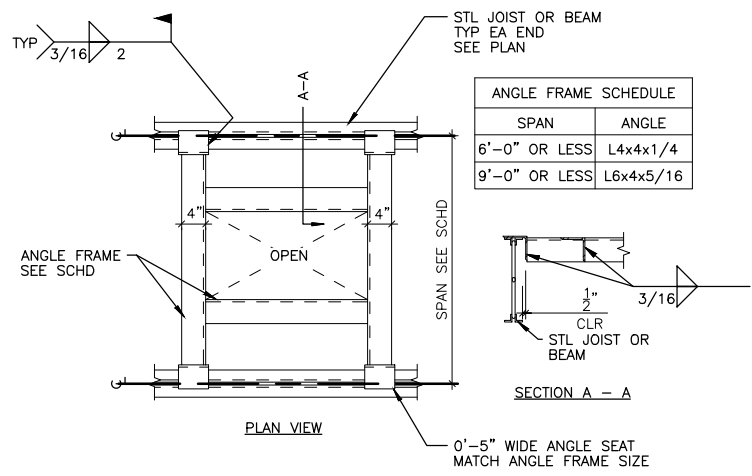
SHEET NO.
S.501



- GENERAL GRATING NOTES:**
1. NOT USED.
 2. DRILL AND TAP SUPPORT ANGLE TO RECEIVE HOLD-DOWN SCREWS. HOLD-DOWN CLIPS SHALL BE REMOVABLE FROM THE TOP SURFACE OF THE GRATING.
 3. ALL SIDES OF GRATING SHALL BE SUPPORTED BY EMBEDDED ANGLE OR FACE-MOUNTED ANGLE.
 4. WHERE COVER PLATES OR FLOOR PLATES ARE INDICATED IN PLAN IN ADDITION TO GRATING, SET GRATING SUPPORT ELEVATIONS LOW ENOUGH TO ENSURE COVER PLATES WILL BE FLUSH WITH ADJACENT WALKING SURFACE(S).
 5. WHERE GRATING IS INDICATED ON PLANS TO BE "REMOVABLE", HOLD-DOWN CLIPS SHALL BE COMPLETELY REMOVABLE FROM TOP SIDE ONLY.
 6. ALL GRATING SHALL BE BANDED AT ENDS AND OPENINGS.
 7. ALL SMOOTH-SURFACE BAR GRATE SHALL HAVE A SLIP-RESISTANT EPOXY/GRIT COATING ON ALL GRATING TOP SURFACES.
 8. BAR GRATE SHALL BE DESIGNED FOR UNIFORM LOAD OR POINT LOAD, WHICHEVER PRODUCES THE GREATEST EFFECT.
 - 8.1. 100PSF OR 300LB

- FRP GRATING NOTES:**
1. FRP GRATING IS SQUARE-PATTERN MOLDED UNO.
 2. STEEL ANGLES, FASTENERS, BARS, & CONCRETE ANCHORS SHALL BE TYPE 316 STAINLESS STEEL.

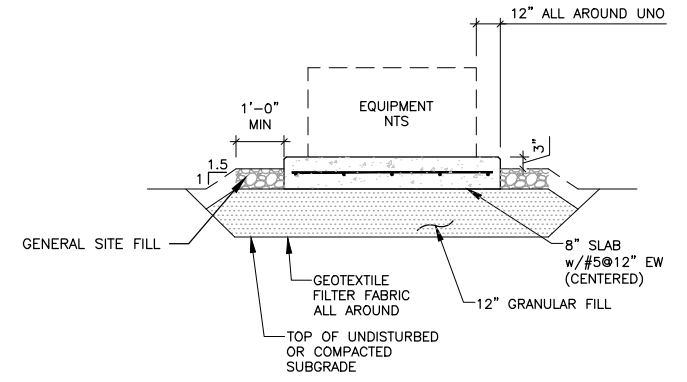
1 BAR GRATE FIGURE
SCALE: NTS



ANGLE FRAME SCHEDULE	
SPAN	ANGLE
6'-0" OR LESS	L4x4x1/4
9'-0" OR LESS	L6x4x5/16

2 TYPICAL ANGLE FRAME AT ALL NEW ROOF PENETRATIONS
SCALE: NTS

- NOTES:**
1. INSTALL THIS DETAIL AT ALL NEW ROOF PENETRATIONS.
 2. EPOXY PAINT PER DIVISION 9 SPECIFICATIONS.



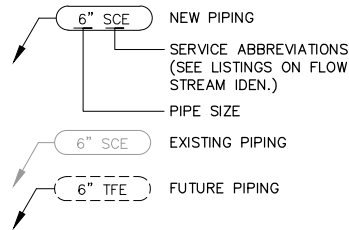
- NOTE:**
1. SURFACE COMPACT EXISTING SOIL, PROOF ROLL, REMOVE AND REPLACE WEAK SOILS AND INSTALL GEOTEXTILE.
 2. CONCRETE SHALL BE MIX 1 UNO WITH LIGHT BROOM FINISH.

3 EXTERIOR EQUIPMENT PAD
SCALE: NTS

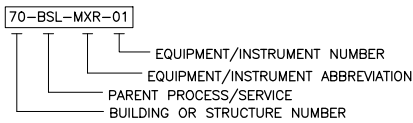
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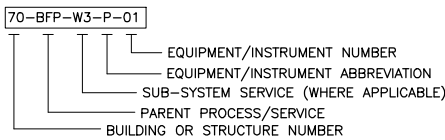
USED WHEN NECESSARY



EQUIPMENT/INSTRUMENT TAGS (4 POSITIONS)



EQUIPMENT/INSTRUMENT TAGS (5 POSITIONS)



AB	AERATION BLOWER
AF	ADJUSTABLE FREQUENCY DRIVE
AH	ACCESS HATCH
AU/AUH	AIR HANDLING UNIT
BC	BELT CONVEYOR
BCV	BALL CHECK VALVE
BFP	BELT FILTER PRESS
BFPF	BELT FILTER PRESS FILTRATE
BFV	BUTTERFLY VALVE
BP	BOOSTER PUMP
BSL	BLENDED SLUDGE
BV	BALL VALVE
CAV	COMBINATION AIR VALVE
CD	CENTRIFUGE DEWATERING
CP	COMPRESSOR
CR	CRANE
CP	CONTROL PANEL
CV	CHECK VALVE
DR	DRIVE
DS	DIGESTED SLUDGE
DTP	DIGESTER TRANSFER PUMP
EF	EXHAUST FAN
EP	EFFLUENT PUMP
FECL	FERROUS CHLORIDE
FM	FLOW METER
GP	GRIT PUMP
GR	GRINDER
GS	GRIT SCREW CONVEYOR
GU	GRIT UNIT
HPF	HORIZONTAL PRESSURE FILTER
HY	HYDRANT
IN	INCUBATOR
IF	INSERTION FLOWMETER
LE	LAB EQUIPMENT
LT	LEVEL TRANSMITTER
MCC	MOTOR CONTROL CENTER
MP	METERING PUMP
MS	MECHANICAL FINE SCREEN
MX	MIXER

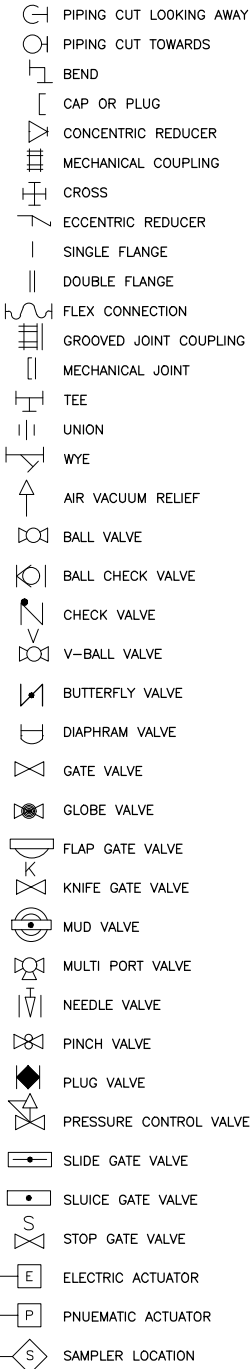
OV	OVERFLOW
PEW	PLANT EFFLUENT REUSE WATER
PF	PARSHALL FLUME
PCHV	PINCH VALVE
POLY	POLYMER
PSL	PRIMARY SLUDGE
PV	PLUG VALVE
RO	REVERSE OSMOSIS SYSTEM
RDT	ROTARY DRUM THICKENER
RDTF	ROTARY DRUM THICKENER FILTRATE
RP	RETURN PUMP
SA	SAMPLER
SAN	SANITARY
SC	SCREEN CONVEYOR
SCL	SECONDARY CLARIFIER
SD	SLUDGE DRYER
SDC	SLUDGE SCREW CONVEYOR
SG	SLIDE GATE/SLUICE GATE
SPM	SUBMERSIBLE PROPELLER MIXER
SP	SLUDGE PUMP
STR	STRAINER
TK	TANK
TS	THICKENED SLUDGE
TSP	THICKENED SLUDGE PUMP
TWAS	THICKENED WASTE ACTIVATED SLUDGE
TWASP	THICKENED WASTE ACTIVATED SLUDGE PUMP
UNO	UNLESS NOTED OTHERWISE
UV	ULTRAVIOLET DISINFECTION
VCP	VITRIFIED CLAY PIPE
VPF	VERTICAL PRESSURE FILTER
WAS	WASTE ACTIVATED SLUDGE
WASP	WASTE ACTIVATED SLUDGE PUMP
WP	WASTE PUMP

NOTE:

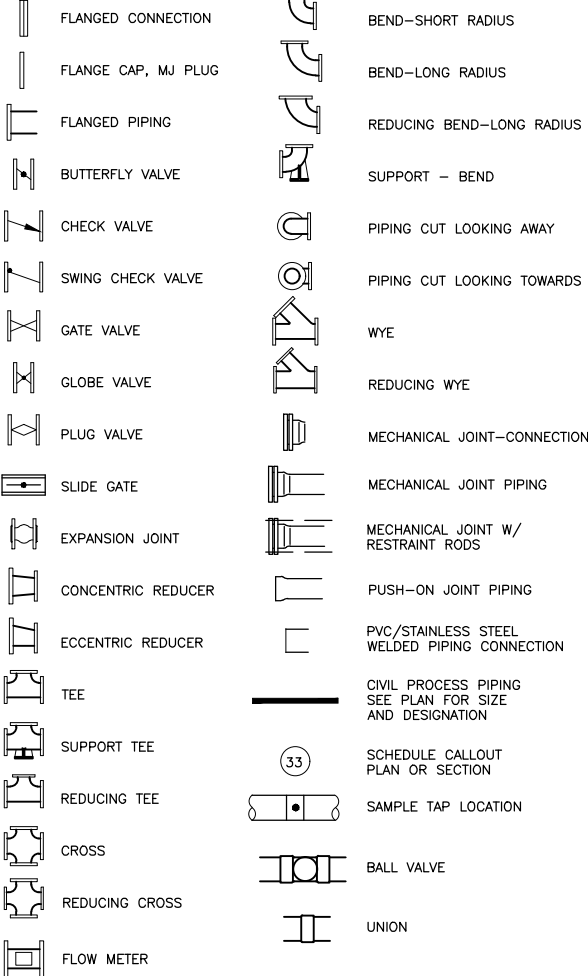
NOT ALL ABBREVIATIONS OR SYMBOLS SHOWN IN THESE LISTS MAY BE USED IN THIS PROJECT. CONTACT ARCHITECT OR ENGINEER FOR CLARIFICATION OF ANY DISCREPANCIES.

PROCESS SYMBOLS

ONE-LINE SYMBOLS



2-LINE SYMBOLS



GENERAL PROCESS NOTES:

- SOME EXISTING PIPING AND EQUIPMENT HAS BEEN OMITTED FROM PROCESS DRAWINGS FOR CLARITY. CONTRACTOR TO VERIFY ALL EXISTING INFORMATION PRIOR TO STARTING WORK.
- SCREENED (LIGHT) DELINEATION SHOWN ON PROCESS SHEETS DENOTES EXISTING CONDITIONS. "SCREENED" INFORMATION WAS TAKEN FROM PREVIOUS CONSTRUCTION DRAWINGS AND FIELD SURVEY, IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ORDERING OF MATERIALS AND BEGINNING CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
- ITEMS PROVIDED BY EQUIPMENT MANUFACTURERS SHALL BE CONFIRMED WITH SHOP DRAWINGS. COORDINATE WITH OWNER AND MANUFACTURER'S REPRESENTATIVE.
- NOT ALL INSTRUMENTATION AND ACCESSORIES PROVIDED BY EQUIPMENT MANUFACTURERS ARE SHOWN. SEE E & IC DRAWINGS AND SPECIFICATIONS FOR MORE DETAILS.
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIALS AND BEGINNING FABRICATION. REPORT ANY SIGNIFICANT DISCREPANCIES TO OWNER AND ENGINEER.
- LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHALL BE DETERMINED IN THE FIELD AND REVIEWED BY THE ENGINEER PRIOR TO INSTALLATION. MAXIMUM SPACING SHALL BE AS SPECIFIED.
- FLANGE ADAPTORS MAY BE USED WHERE APPROVED BY ENGINEER. FLANGE ADAPTORS SHALL BE PROVIDED AS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES/EQUIPMENT.
- ALL NEW PIPING SHALL BE PRESSURE TESTED IN ACCORDANCE WITH SPECIFICATION SECTION 22 1117. AFTER THE PIPING HAS BEEN CLEANED, EACH LEAK WHICH IS DISCOVERED WITHIN THE MAINTENANCE BONDING PERIOD SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.
- PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH INSTALLATION, THE CONTRACTOR SHALL FIELD VERIFY AND MEASURE ALL TIE-IN LOCATIONS AND CONFIRM THE LOCATION, SIZE, AND ORIENTATION OF ALL EXISTING PIPING TO WHICH NEW PIPING WILL BE CONNECTED. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING ANY DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE CONTRACT DOCUMENTS. ANY VARIATIONS OR CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO FABRICATION OR MATERIAL PROCUREMENT.
- ONCE FIELD VERIFICATIONS ARE COMPLETED, THE CONTRACTOR SHALL SUBMIT A DETAILED PIPING PLAN FROM THE PIPING MANUFACTURER FOR REVIEW. THIS PLAN SHALL INCLUDE A LAY SCHEDULE, PIPE SEGMENT DIMENSIONS, LOCATIONS OF ALL FITTINGS, AND ANY OTHER RELEVANT DETAILS. THE SUBMITTAL MUST BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO FABRICATION OR SHIPMENT OF MATERIALS.

DRAWN BY: BDB JOB DATE: 2025
APPROVED: MJR JOB NUMBER: 2303827
CAD DATE: 1/29/2025 12:44:00 PM
CAD FILE: J:\2023\2303827\CAD\Dwgs\P\000 LEGEND.dwg

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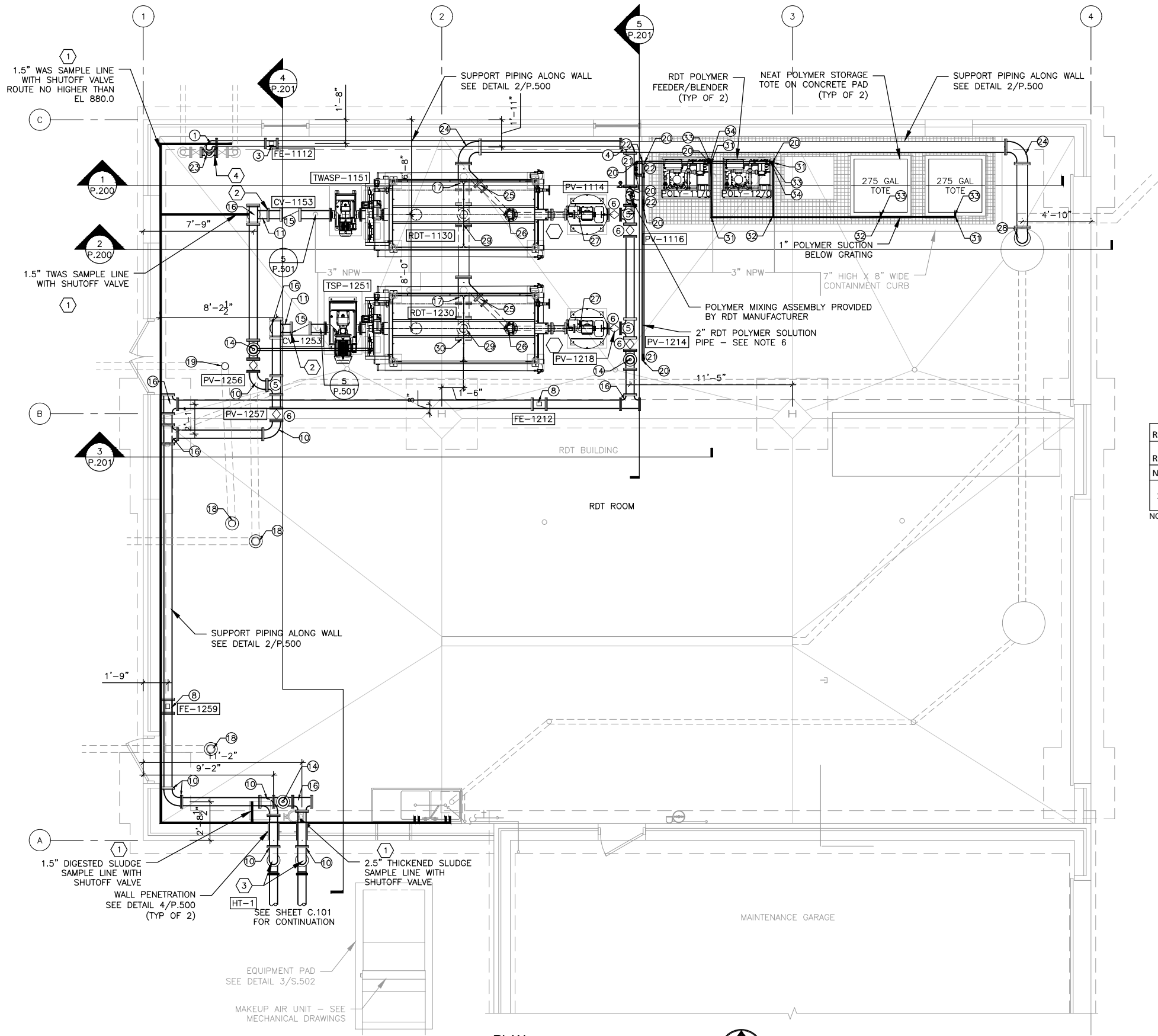
WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

PROCESS

PROCESS LEGEND & GENERAL NOTES

SHEET NO.

P.000



GENERAL NOTES:

- REFER TO SHEET P.000 FOR ADDITIONAL GENERAL NOTES FOR PROCESS.
- SOME EXISTING PIPING AND EQUIPMENT HAS BEEN OMITTED FROM DRAWING FOR CLARITY. CONTRACTOR TO VERIFY ALL EXISTING INFORMATION PRIOR TO STARTING WORK.
- CONTRACTOR TO CONFIRM RDT FEEDER/BLENDER CONNECTIONS WITH SELECTED EQUIPMENT AND MANUFACTURER.
- RDT AND POLYMER FEEDER SYSTEM SHALL BE INSTALLED BY CONTRACTOR WITH ALL NECESSARY COMPONENTS FOR A COMPLETE INSTALLATION. COORDINATE LOCATION AND MOUNTING OF MANUFACTURER SUPPLIED EQUIPMENT WITH OWNER AND MANUFACTURER'S REPRESENTATIVE. REFER TO MECHANICAL SHEETS FOR NPW CONNECTIONS.
- REFER TO SPECIFICATION SECTION 01 1000 FOR SEQUENCING REQUIREMENTS.
- CONTRACTOR TO FIELD ROUTE POLYMER SOLUTION PIPING FROM POLYMER FEEDER/BLENDER TO RDTs WITH ENGINEER AND OWNER APPROVAL.
- SEE S-SHEETS FOR PIPE SUPPORTS HUNG FROM EXISTING ROOF STRUCTURE. NOT ALL WALL SUPPORTS AND PIPE HANGERS ARE SHOWN ON PLANS. CONTRACTOR TO REFER TO SPECIFICATION SECTION 22 0529 FOR FULL REQUIREMENTS OF PIPE HANGERS AND SUPPORTS.
- CLEAN AND PREP WALLS IN RDT ROOM PRIOR TO PAINTING PER SPECIFICATION 09 9000, REFER TO ROOF FINISH SCHEDULE ON THIS SHEET.

KEY NOTES: (#)

- CONTRACTOR TO FIELD ROUTE SAMPLE LINES TO SAMPLE SINK BASIN. ADJUST ROUTING IN FIELD AS NECESSARY TO AVOID CONFLICTS. TAPPING SLEEVES IN ACCORDANCE WITH SPECIFICATION SECTION 22 1116.01.
- INSTALL NEW ISOLATION RING, 1/4-INCH SST PIPING, FITTINGS, BALL VALVES, PRESSURE GAUGE, AND PRESSURE SWITCH, SEE DETAIL 1/P.500.
- HEAT TRACE AND INSULATE EXPOSED AND VERTICAL UNDERGROUND PIPING IN ACCORDANCE WITH SPECIFICATION SECTIONS 22 0533 AND 22 0719.
- ROTATE EXISTING 4"x4" TEE 90 DEG UP.

ROOM FINISH SCHEDULE													
ROOM		FLOOR		N. WALL		E. WALL		S. WALL		W. WALL		CEILING	
NO.	NAME	MAT'L	FIN.	MAT'L	FIN.	MAT'L	FIN.	MAT'L	FIN.	MAT'L	FIN.	MAT'L	FIN.
100	RDT ROOM	CONC	NOTE	CMU	EPOXY	CMU	EPOXY	CMU BRICK	EPOXY EXIST	CMU	EPOXY	STL	EXIST

NOTES: PERIMETER OF WORKING CLEARANCE AROUND THE NEW MCC TO BE PAINTED SAFETY YELLOW.
BOLD CELLS INDICATE ROOM ELEMENTS TO BE PAINTED UNDER THIS CONTRACT. SEE SPECIFICATION SECTION 09 9000

FITTING SCHEDULE (#)	
MARK	DESCRIPTION
1	4" - 90° BEND
2	NOT USED
3	4" FLOW METER
4	6"x4" - 90° REDUCING BEND
5	6"x6" TEE
6	6" PLUG VALVE
7	6" - 90° BEND
8	6" FLOW METER
9	6" - 90° BASE BEND
10	6" LONG RADIUS - 90° BEND
11	6" LONG RADIUS - 90° BASE BEND
12	6"x3" CONC REDUCER
13	3" SS BALL VALVE
14	AIR RELEASE VALVE
15	6" CHECK VALVE
16	6"x6" TEE W/BLIND FLANGE
17	8"x4" REDUCING WYE
18	6" BLIND FLANGE AT FLOOR
19	NOT USED
20	2" - 90° BEND
21	2" BALL VALVE
22	2"x2" TEE
23	4" - 45° BEND
24	8" - LONG RADIUS 90° BEND
25	4"x3" CONC REDUCER
26	3" - 45° BEND
27	3" - 90° BEND
28	8" - 90° BEND
29	8"x6" REDUCING TEE
30	8" BLIND FLANGE
31	1" - 90° BEND
32	1"x1" TEE
33	1" BALL VALVE
34	1"x1/2" REDUCER

1 PLAN
SCALE: 1/4"=1'-0"



DRAWN BY: BDB JOB DATE: 2025
APPROVED: JPF JOB NUMBER: 2303827
CAD DATE: 2/5/2025 3:48:02 PM
CAD FILE: J:\2023\2303827\CAD\DWGS\B\100 THICKENING BLDG PLAN.dwg

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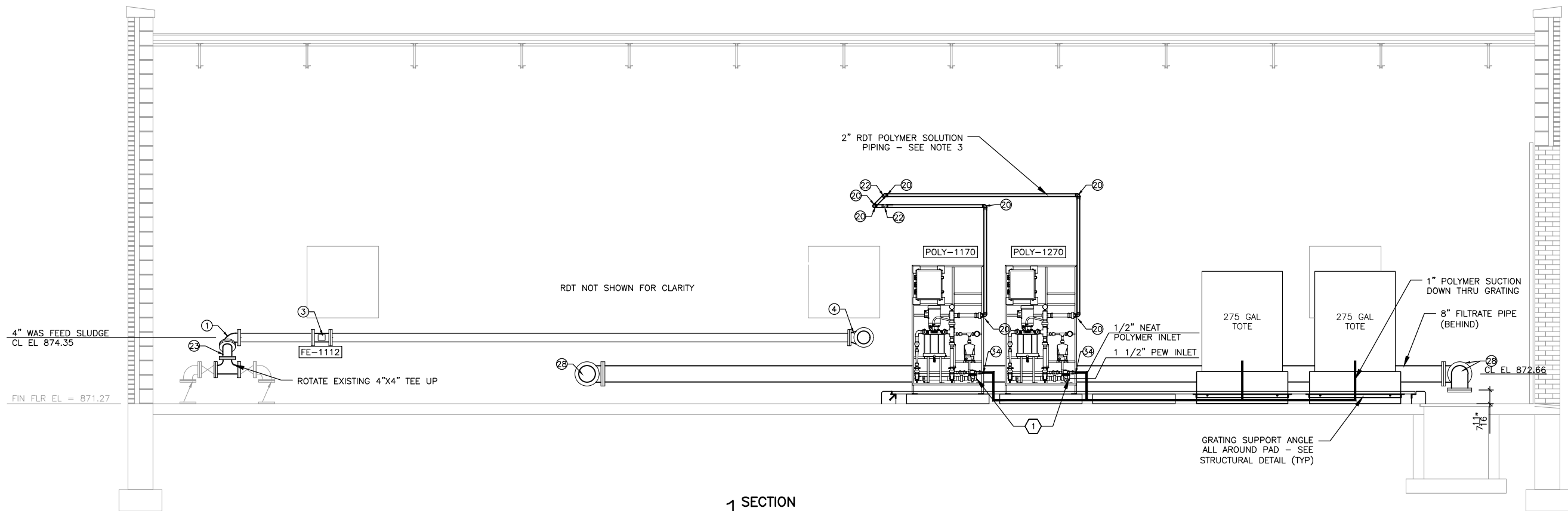
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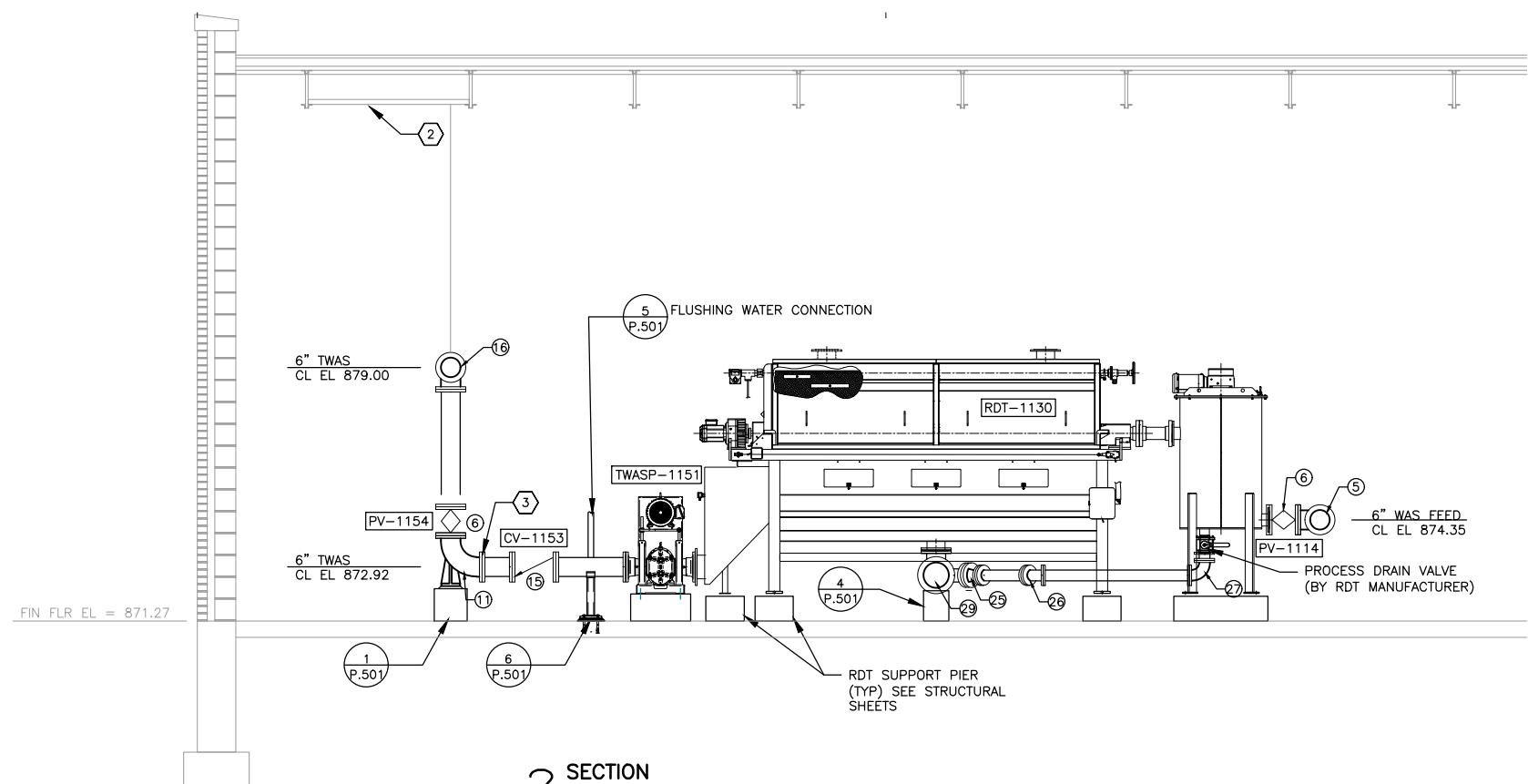
WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

PROCESS
RDT BUILDING PLAN

SHEET NO.
P.100



1 SECTION
SCALE: 3/8"=1'-0"



2 SECTION
SCALE: 3/8"=1'-0"

FITTING SCHEDULE #	
MARK	DESCRIPTION
1	4" - 90° BEND
2	NOT USED
3	4" FLOW METER
4	6"x4" - 90° REDUCING BEND
5	6"x6" TEE
6	6" PLUG VALVE
7	6" - 90° BEND
8	6" FLOW METER
9	6" - 90° BASE BEND
10	6" LONG RADIUS - 90° BEND
11	6" LONG RADIUS - 90° BASE BEND
12	6"x3" CONC REDUCER
13	3" SS BALL VALVE
14	AIR RELEASE VALVE
15	6" CHECK VALVE
16	6"x6" TEE W/BLIND FLANGE
17	8"x4" REDUCING WYE
18	6" BLIND FLANGE AT FLOOR
19	NOT USED
20	2" - 90° BEND
21	2" BALL VALVE
22	2"x2" TEE
23	4" - 45° BEND
24	8" - LONG RADIUS 90° BEND
25	4"x3" CONC REDUCER
26	3" - 45° BEND
27	3" - 90° BEND
28	8" - 90° BEND
29	8"x6" REDUCING TEE
30	8" BLIND FLANGE
31	1" - 90° BEND
32	1"x1" TEE
33	1" BALL VALVE
34	1"x1/2" REDUCER

- GENERAL NOTES:**
- REFER TO P.000 FOR ADDITIONAL GENERAL NOTES FOR PROCESS.
 - RDT AND POLYMER FEEDER SYSTEM SHALL BE INSTALLED BY CONTRACTOR WITH ALL NECESSARY COMPONENTS FOR A COMPLETE INSTALLATION. COORDINATE LOCATION AND MOUNTING OF MANUFACTURER SUPPLIED EQUIPMENT WITH OWNER AND MANUFACTURER'S REPRESENTATIVE. REFER TO MECHANICAL SHEETS FOR NPW CONNECTIONS.
 - CONTRACTOR TO FIELD ROUTE RDT POLYMER SOLUTION PIPING FROM POLYMER FEEDER/BLENDER TO RDTs WITH ENGINEER AND OWNER APPROVAL.

- KEY NOTES:** #
- REFER TO SHEET M.100 FOR WATER CONNECTIONS TO RDT POLYMER FEEDER/BLENDERS.
 - SEE S-SHEETS FOR PIPE SUPPORTS HUNG FROM EXISTING ROOF STRUCTURE.
 - INSTALL NEW ISOLATION RING, 1/4" SST PIPING, FITTINGS, BALL VALVES. PRESSURE GAUGE AND PRESSURE SWITCH, SEE DETAIL 1/P.500.

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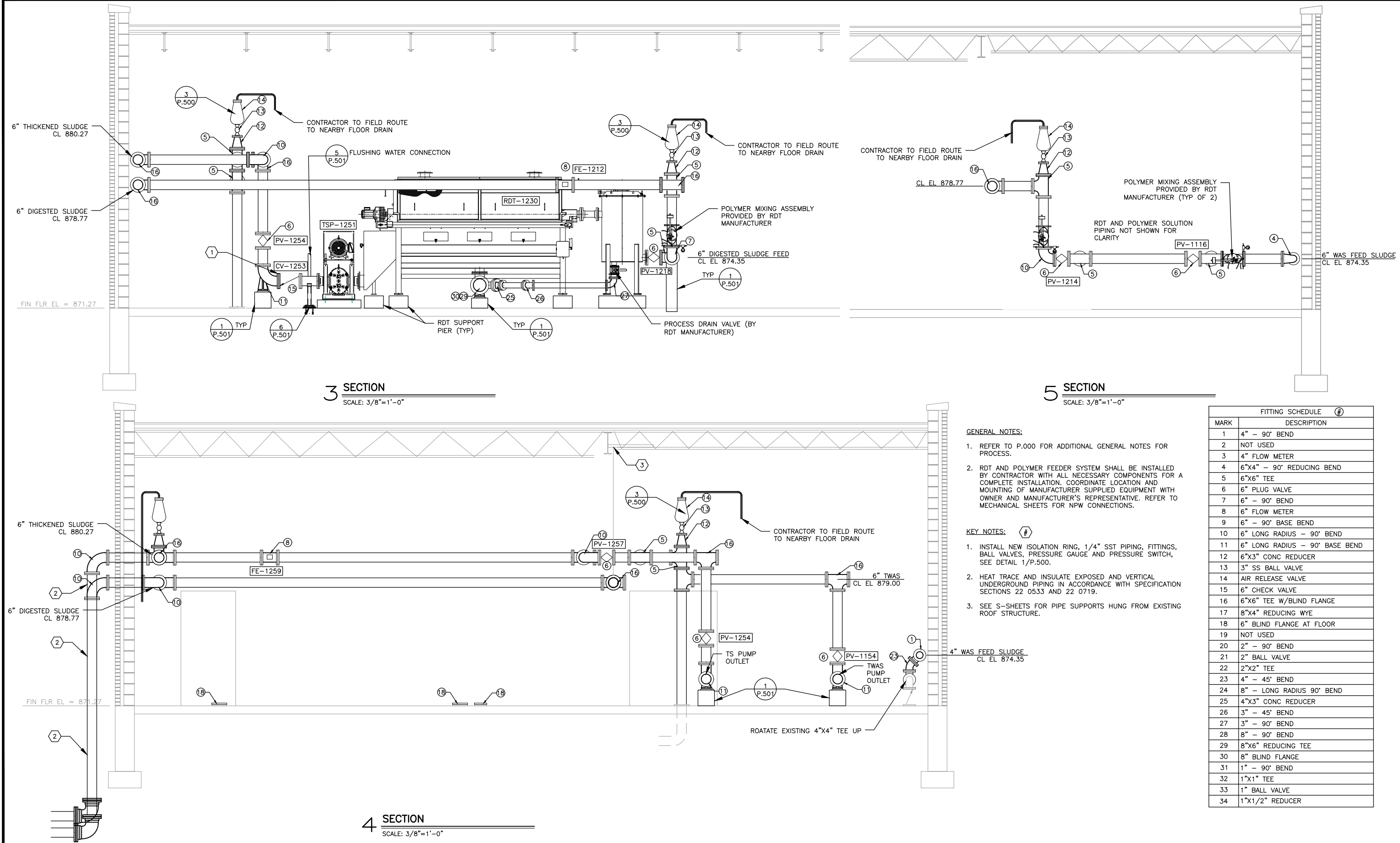


WPCP SLUDGE THICKENING IMPROVEMENTS
 CITY OF MARSHALLTOWN
 MARSHALLTOWN, IOWA

PROCESS
PROCESS SECTIONS

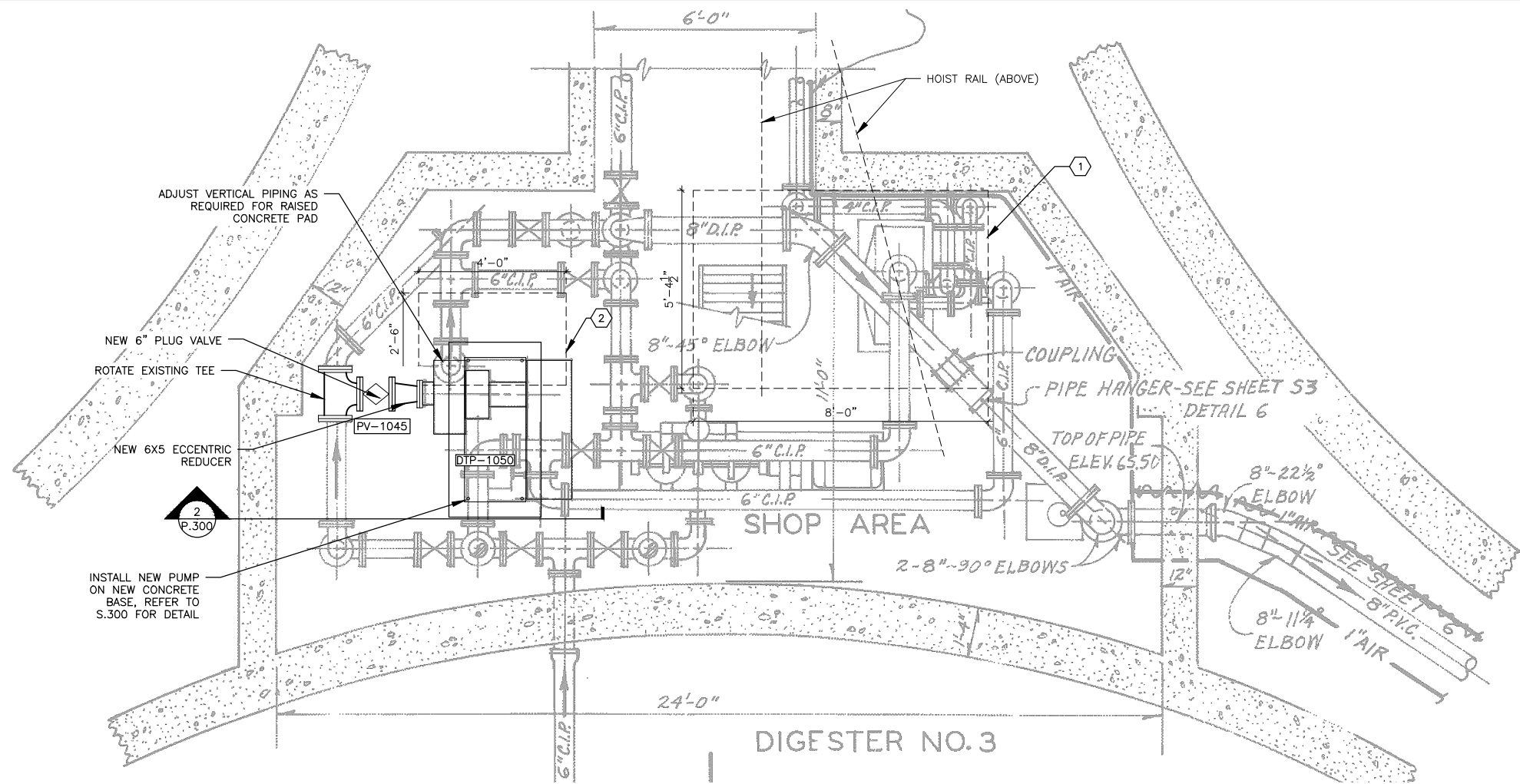
SHEET NO.
P.200

Xrefs: xgl-1-dm01: XAX-0-S01: XP-1-S01

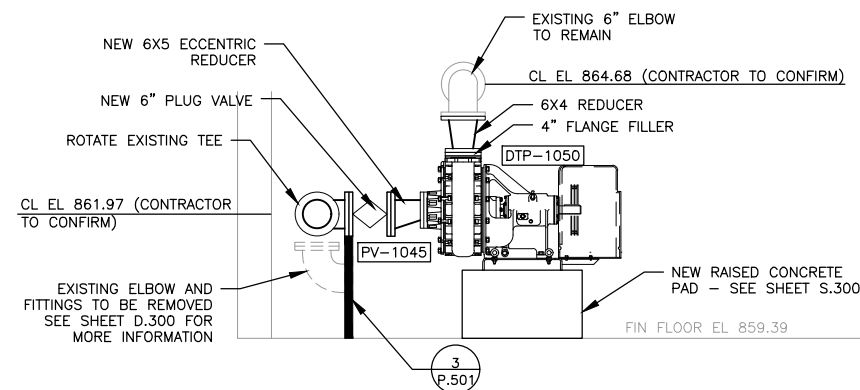


- GENERAL NOTES:**
- 1. REFER TO P.000 FOR ADDITIONAL GENERAL NOTES FOR PROCESS.
 - 2. RDT AND POLYMER FEEDER SYSTEM SHALL BE INSTALLED BY CONTRACTOR WITH ALL NECESSARY COMPONENTS FOR A COMPLETE INSTALLATION. COORDINATE LOCATION AND MOUNTING OF MANUFACTURER SUPPLIED EQUIPMENT WITH OWNER AND MANUFACTURER'S REPRESENTATIVE. REFER TO MECHANICAL SHEETS FOR NPW CONNECTIONS.
- KEY NOTES:**
- 1. INSTALL NEW ISOLATION RING, 1/4" SST PIPING, FITTINGS, BALL VALVES, PRESSURE GAUGE AND PRESSURE SWITCH, SEE DETAIL 1/P.500.
 - 2. HEAT TRACE AND INSULATE EXPOSED AND VERTICAL UNDERGROUND PIPING IN ACCORDANCE WITH SPECIFICATION SECTIONS 22 0533 AND 22 0719.
 - 3. SEE S-SHEETS FOR PIPE SUPPORTS HUNG FROM EXISTING ROOF STRUCTURE.

FITTING SCHEDULE #	
MARK	DESCRIPTION
1	4" - 90° BEND
2	NOT USED
3	4" FLOW METER
4	6"x4" - 90° REDUCING BEND
5	6"x6" TEE
6	6" PLUG VALVE
7	6" - 90° BEND
8	6" FLOW METER
9	6" - 90° BASE BEND
10	6" LONG RADIUS - 90° BEND
11	6" LONG RADIUS - 90° BASE BEND
12	6"x3" CONC REDUCER
13	3" SS BALL VALVE
14	AIR RELEASE VALVE
15	6" CHECK VALVE
16	6"x6" TEE W/BLIND FLANGE
17	8"x4" REDUCING WYE
18	6" BLIND FLANGE AT FLOOR
19	NOT USED
20	2" - 90° BEND
21	2" BALL VALVE
22	2"x2" TEE
23	4" - 45° BEND
24	8" - LONG RADIUS 90° BEND
25	4"x3" CONC REDUCER
26	3" - 45° BEND
27	3" - 90° BEND
28	8" - 90° BEND
29	8"x6" REDUCING TEE
30	8" BLIND FLANGE
31	1" - 90° BEND
32	1"x1" TEE
33	1" BALL VALVE
34	1"x1/2" REDUCER



1 PLAN
SCALE: 1/2" = 1'-0"



NOTE: NOT ALL EXISTING PIPING SHOWN FOR CLARITY

2 PIPING SECTION AT NEW PUMP
SCALE: 1/2" = 1'-0"

GENERAL NOTES:

1. REFER TO SHEET P.000 FOR ADDITIONAL GENERAL NOTES FOR PROCESS.
2. BACKGROUND CONTENT ON THIS DRAWING IS ORIGINALLY FROM WPCP BIOSOLIDS IMPROVEMENTS PROJECT, 2002, PROJECT NUMBER 2407-00A INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO BEGINNING WORK.
3. CONTRACTORS USE OF OWNER'S 2-TON MONORAIL AND HOIST WILL BE PERMITTED. CONTRACTOR SHALL COORDINATE USE OF MONORAIL AND HOIST WITH OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OF ANY DAMAGES TO THE MONORAIL AND HOIST AND/OR BUILDING INFRASTRUCTURE, ETC. CAUSED BY CONTRACTOR'S USE OF THE MONORAIL AT NO COST TO THE OWNER.
4. REFER TO SPECIFICATION SECTION 01 1000 FOR SEQUENCING REQUIREMENTS.

KEY NOTES: #

1. EXTENTS OF STRUCTURAL OPENING ABOVE FOR ACCESS TO LOWER LEVEL FOR EQUIPMENT REPLACEMENT. COMBINATION OF REMOVABLE GRATING AND SHIPS LADDER. CONTRACTOR RESPONSIBLE FOR ALL REMOVALS, RIGGING, AND STAGING TO INSTALL NEW PUMP AND PIPING.
2. 48"x30" OPENING ABOVE WITH GRATING.

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APPROVED: JPF JOB NUMBER: 2303827
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CAD FILE: J:\2023\2303827\CAD\Dwgs\P\300 DIGESTER BLDG PLAN.dwg

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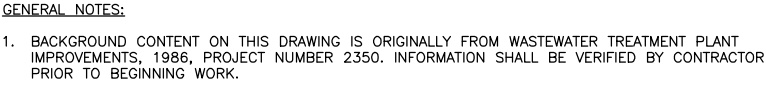


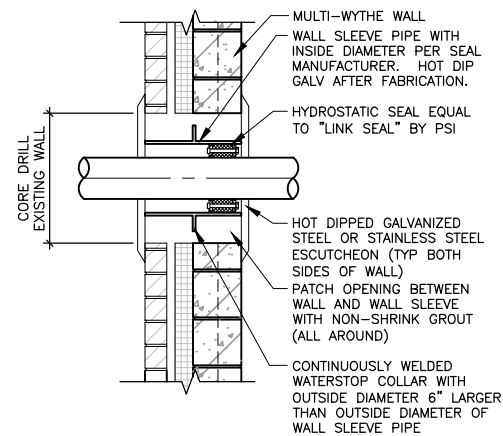
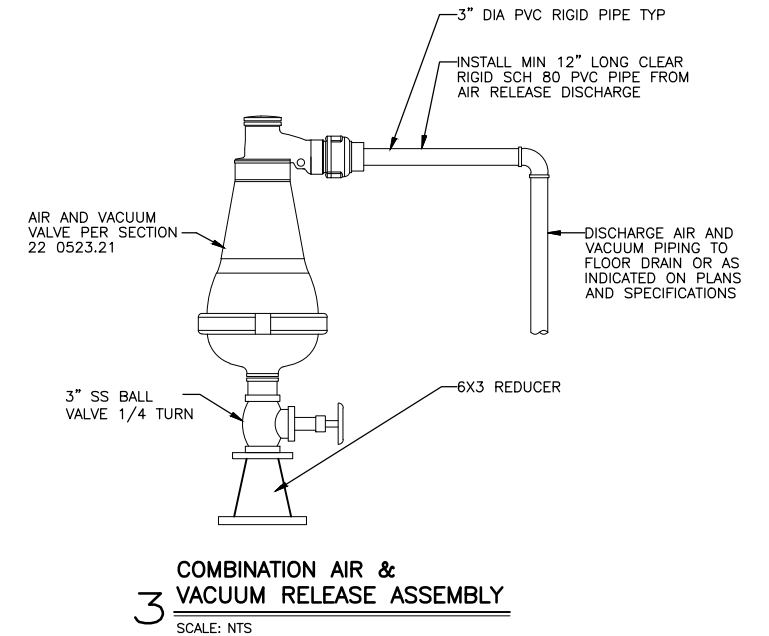
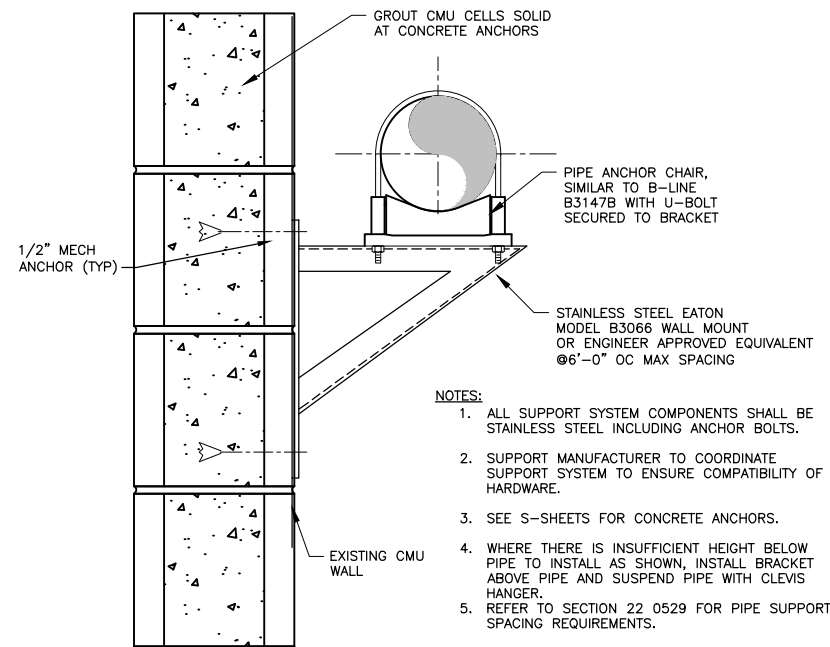
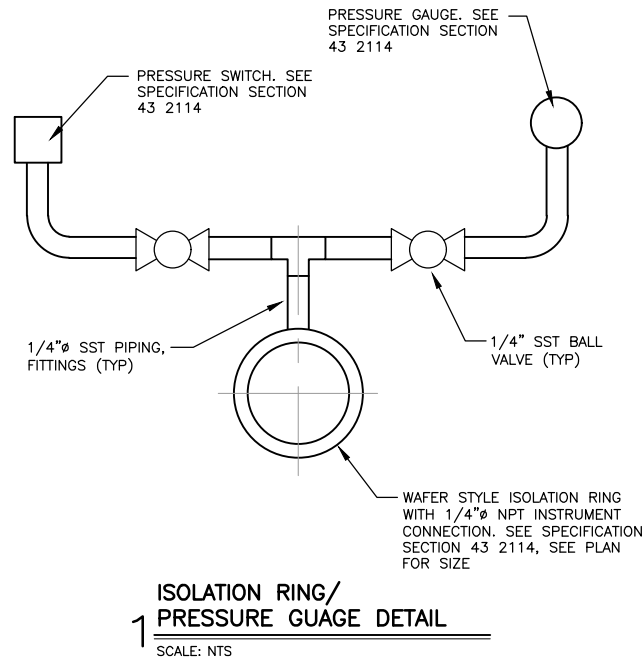
WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

PROCESS
DIGESTER CONTROL BUILDING PLAN

SHEET NO.
P.300

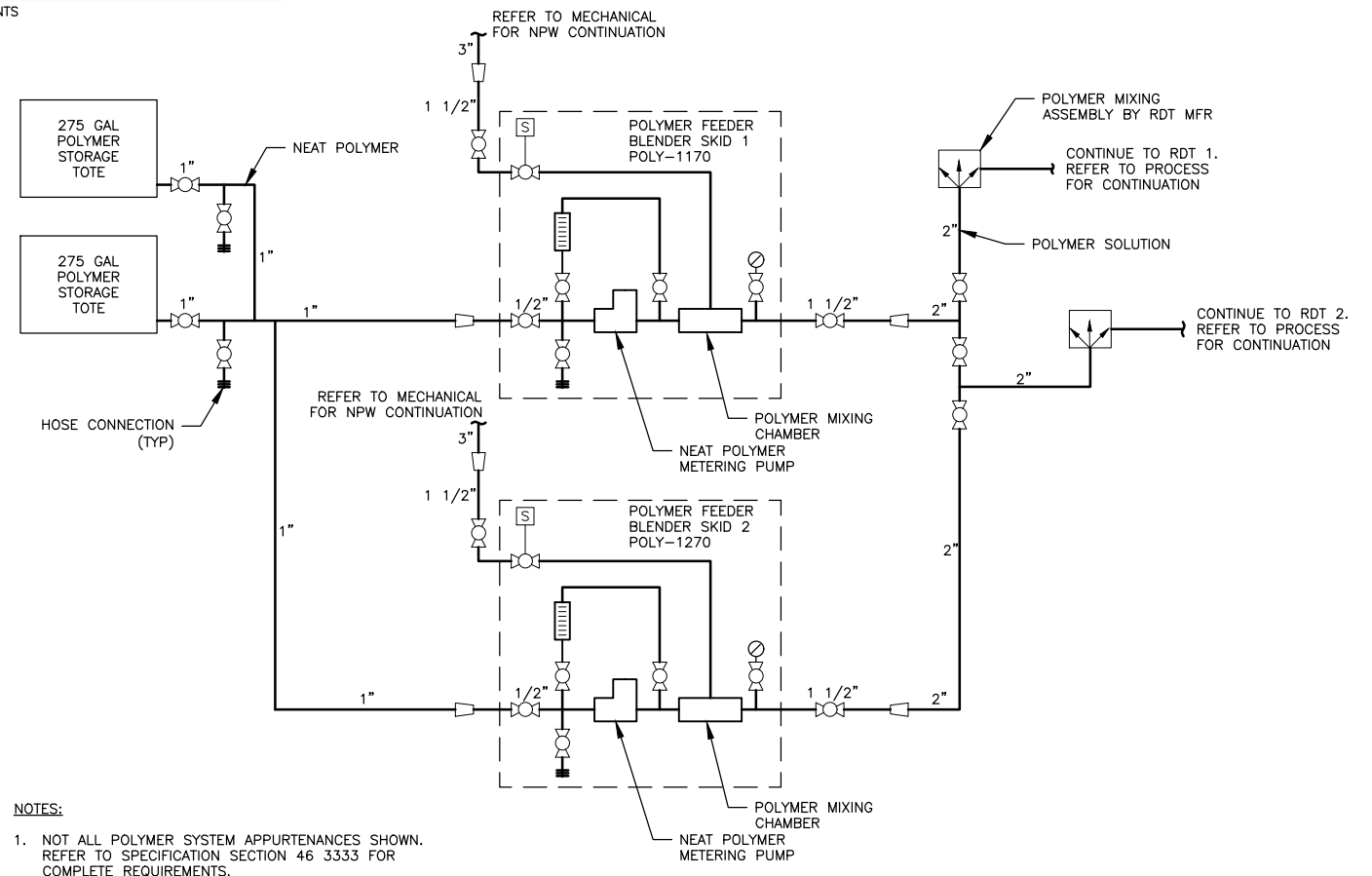
Xrefs: xgl-1-dm01: XPX-0-P02; XP-2-P01; XP-2-001





PIPE SIZE	SLEEVE SIZE (UNLESS OTHERWISE NOTED)
1" & SMALLER	3" (1)
1 1/4" & 1 1/2"	3 1/2" (1)
2"	4" (1)
3"	6" (2) (4)
4"	6" (2) (4)
6"	8" (3) (4)
8" & LARGER	PIPE OD +2"± (3) (4)

- (1) SCHEDULE 40 GALV STEEL PIPE
(2) SCHEDULE 20 GALV STEEL PIPE, MINIMUM
(3) 1/4" MINIMUM WALL THICKNESS
(4) IF PIPE IS FLANGED, USE SLEEVE LARGE ENOUGH FOR FLANGE TO PASS THROUGH



- NOTES:
1. NOT ALL POLYMER SYSTEM APPURTENANCES SHOWN. REFER TO SPECIFICATION SECTION 46 3333 FOR COMPLETE REQUIREMENTS.

5 POLYMER FEED SYSTEM SCHEMATIC

SCALE: NTS

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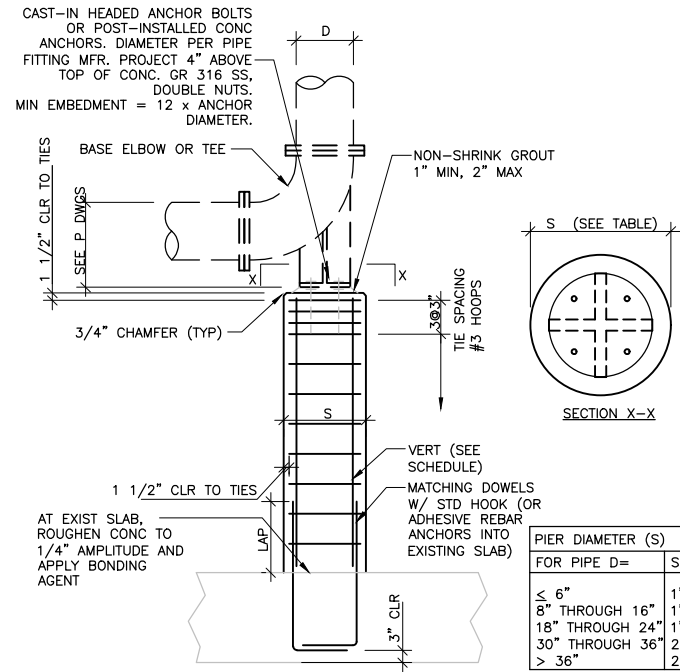
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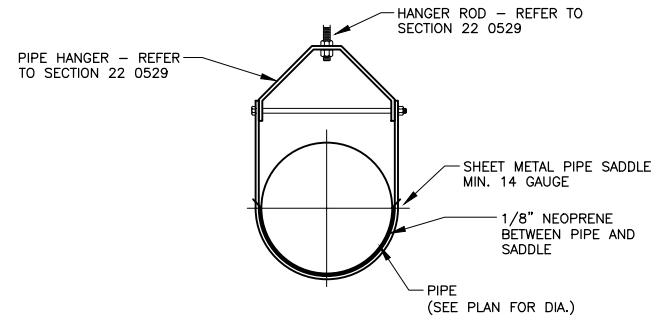
WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

PROCESS
PROCESS DETAILS

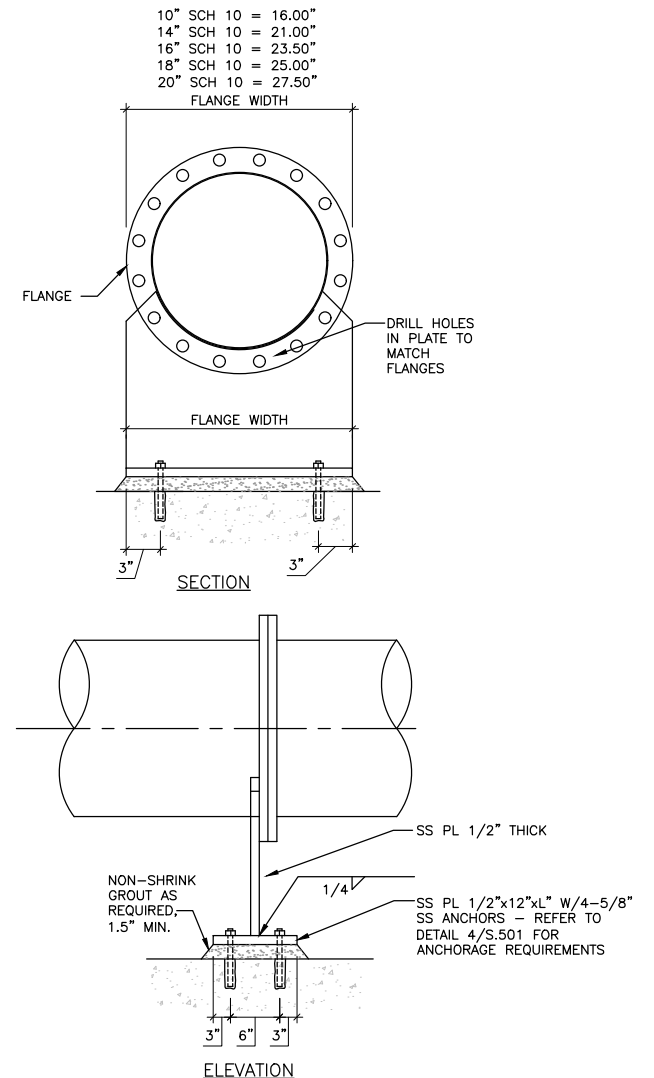
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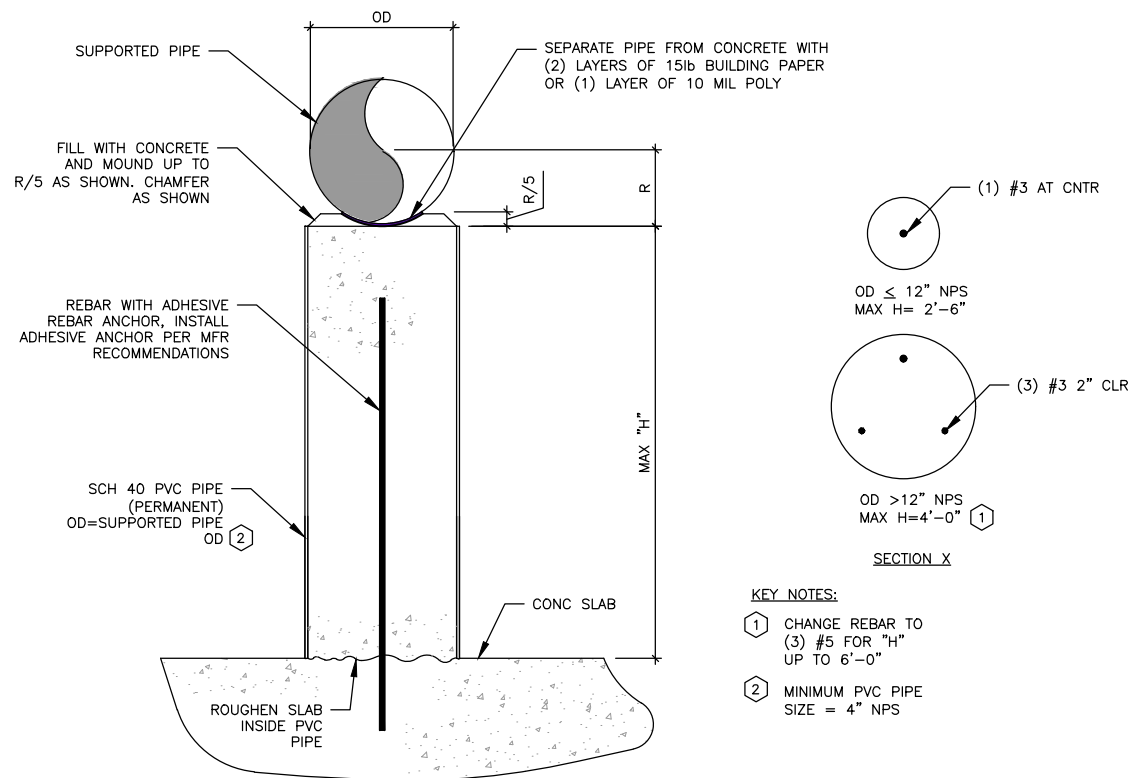
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SCALE: NTS



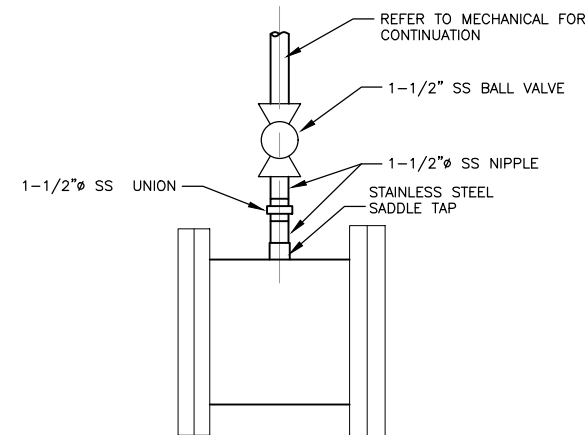
2 ADJUSTABLE CLEVIS PIPE HANGER
SCALE: NTS



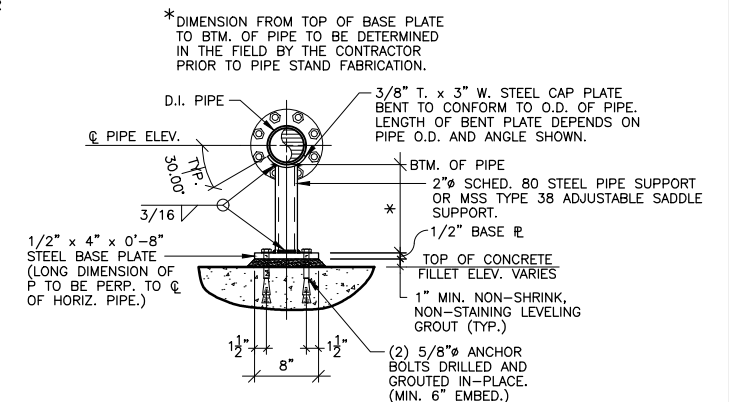
3 RIGID PIPE SUPPORT
SCALE: NTS



4 PVC PIPE SUPPORT DETAIL
SCALE: NTS

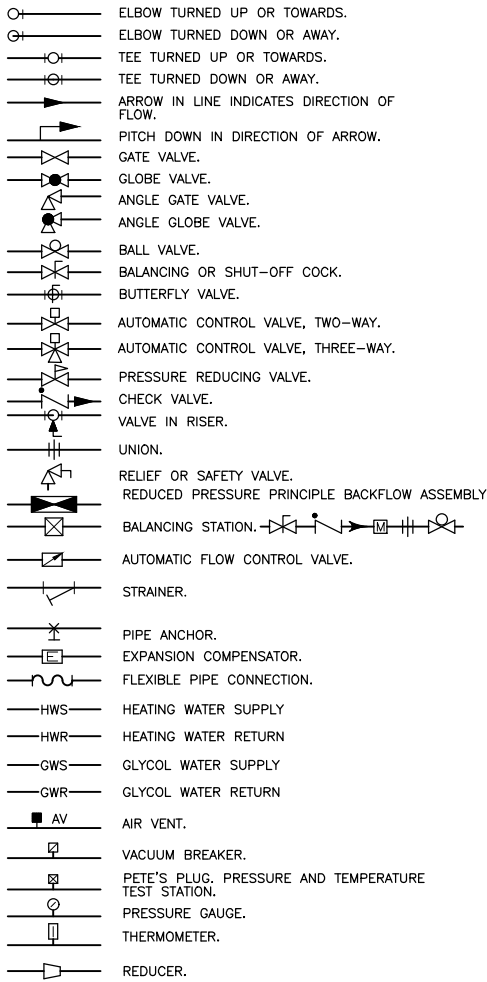


5 FLUSHING WATER CONNECTION
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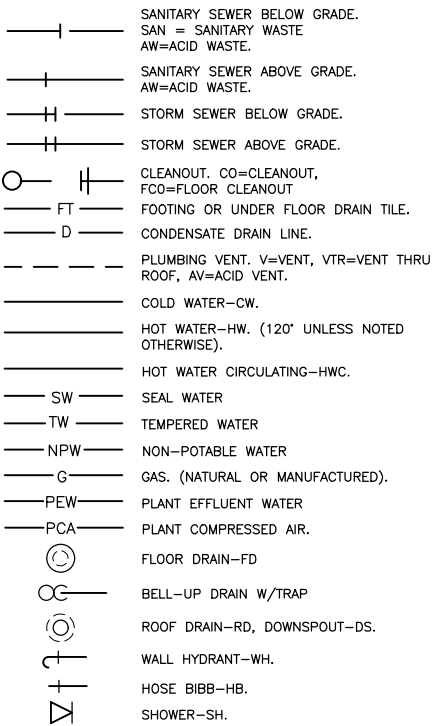


6 TYPICAL PIPE SUPPORT
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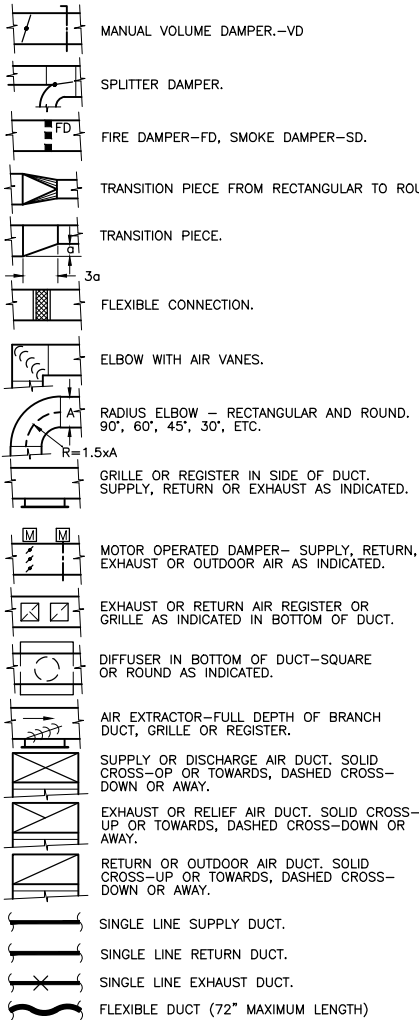
PIPING SYMBOLS



PLUMBING SYMBOLS



SHEETMETAL SYMBOLS



PLUMBING ABBREVIATIONS

BFP	BACK FLOW PREVENTOR
DF	DRINKING FOUNTAIN
DW	DOMESTIC WATER
EWC	ELECTRIC WATER COOLER
ESH	EMERGENCY SHOWER/EYE WASH
EWB	ELECTRIC WATER HEATER
FD	FLOOR DRAIN
FP	FIRE PROTECTION
MS	MOP SINK
LAV	LAVATORY
OD	OVERFLOW ROOF DRAIN
RD	ROOF DRAIN
SH	SHOWER
SK	SINK
SP	SUMP PUMP
SS	SERVICE SINK
WC	WATER CLOSET
WH	WATER HEATER
UR	URINAL
V	VENT

SHEETMETAL ABBREVIATIONS

SA	- SUPPLY AIR	BDD	- BACK DRAFT DAMPER
RA	- RETURN AIR	BOD	- BOTTOM OF DUCT
EA	- EXHAUST AIR		

DIFFUSER, GRILLE, AND REGISTER NOTATION

CD-1	TYPE (SEE ABBREVIATIONS)	CD	- CEILING DIFFUSER
8ø	TAG # (SEE SCHEDULE)	SD	- SUPPLY DIFFUSER
200	NECK SIZE (INCHES)	RG	- RETURN GRILLE
	AIRFLOW (CFM)	EG	- EXHAUST GRILLE

DUCT INSIDE DIMENSION IN INCHES

8ø - ROUND
18x12 - RECTANGULAR OR SQUARE
FIRST NUMBER: SIDE OF DUCT SHOWN
SECOND NUMBER: SIDE OF DUCT NOT SHOWN

GENERAL MECHANICAL NOTES:

1. PROVIDE ALL EQUIPMENT, MATERIALS, AND LABOR AS REQUIRED FOR THE COMPLETE INSTALLATION OF ALL WORK SHOWN AND TO PROVIDE FOR A COMPLETE OPERABLE SYSTEM. ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER.
2. THE DRAWINGS ARE DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND TO INDICATE THE GENERAL ARRANGEMENT AND APPROXIMATE ROUTING. CERTAIN BASIC ITEMS SUCH AS OFFSETS, FITTINGS, ACCESS PANELS, HANGERS AND SLEEVES MAY NOT BE SHOWN. WHERE SUCH ITEMS ARE REQUIRED FOR PROPER INSTALLATION OF THE WORK, SUCH ITEMS SHALL BE INCLUDED. CONTRACTOR TO VERIFY CONNECTIONS, CLEARANCES AND SERVICE PRIOR TO INSTALLATION.
3. COORDINATE FINAL LOCATIONS OF DUCTWORK, PIPING AND MECHANICAL EQUIPMENT IN NEW ADDITION WITH OTHER TRADES TO AVOID INTERFERENCE'S WITH EQUIPMENT, STRUCTURE, PIPING, LIGHTING, AND CONDUIT. PROVIDE OFFSETS AS REQUIRED TO MEET SPACE REQUIREMENTS AND TO AVOID INTERFERENCES. NO PIPING SHALL RUN OVER THE TOP OF ANY ELECTRICAL PANELS OR ELECTRICAL EQUIPMENT.
4. CONTRACTOR SHALL COORDINATE ALL WALL AND ROOF OPENINGS AS IT RELATES TO HIS WORK. CUTTING OF STRUCTURAL SUPPORT MEMBERS WILL NOT BE PERMITTED WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER. EXTENT OF CUTTING SHALL BE MINIMIZED TO PROVIDE THE NEAT MINIMUM OPENING REQUIRED. PATCHING SHALL MATCH ADJACENT MATERIALS AND SURFACES.
5. EQUIPMENT AND MATERIALS SHALL BE PROTECTED FROM WEATHER, PAINTING, PLASTER, ETC. UNTIL THE PROJECT IS COMPLETE. DAMAGE FROM RUST, PAINT SCRATCHES, ETC. SHALL BE REPAIRED AS REQUIRED TO RESTORE EQUIPMENT TO ORIGINAL CONDITION.
6. TEMPORARY SHUTDOWNS IF REQUIRED SHALL BE COORDINATED WITH THE OWNER TO MINIMIZE THE INTERRUPTIONS TO THE OWNER.
7. THE SITE SHALL BE KEPT ORDERLY AND REASONABLY CLEAN AT ALL TIMES DURING CONSTRUCTION. AT THE CONCLUSION OF THE CONSTRUCTION, THE SITE SHALL BE CLEANED THOROUGHLY OF ALL WASTE, RUBBLE, DEBRIS, AND UNUSED MATERIALS.
8. ALL WORK SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, INTERNATIONAL MECHANICAL CODE, UNIFORM PLUMBING CODE, INTERNATIONAL ENERGY CODE, INTERNATIONAL FUEL GAS CODE, AND ALL APPLICABLE STATE AND LOCAL CODES, RULES, AND REGULATIONS AND ORDINANCES.

GENERAL PLUMBING NOTES:

1. PIPING IS SHOWN IN SCHEMATIC FORM. ROUTE PIPING AS REQUIRED FOR CLEARANCE WITH STRUCTURAL CONDITIONS. COORDINATE WITH OTHER TRADES AS REQUIRED. PIPING SHALL BE INSTALLED WITH ADEQUATE SLOPE AS REQUIRED FOR EACH PARTICULAR SYSTEM.
2. INSTALL PIPING TO MAINTAIN HEADROOM, CONSERVE SPACE, AND NOT INTERFERE WITH USE OF SPACE. GROUP PIPING WHERE PRACTICAL AT COMMON ELEVATIONS. ROUTE PIPING IN AN ORDERLY MANNER AND MAINTAIN GRADIENT. ROUTE PARALLEL AND PERPENDICULAR TO WALLS.
3. COORDINATE ROUGH-IN AND FINAL LOCATIONS OF NEW AND RELOCATED PIPING WITH EXISTING LIGHTING, STRUCTURE, PIPING, SPRINKLER AND DUCTWORK, ETC. PROVIDE OFFSETS AND/OR EASEMENTS AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL OTHER TRADES.
4. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
5. PROVIDE CLEARANCE IN HANGERS AND FROM STRUCTURE AND OTHER EQUIPMENT FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
6. ROUGH-IN AND CONNECT ALL PLUMBING REQUIRED TO EQUIPMENT FURNISHED AND INSTALLED BY OTHERS.
7. FURNISH AND INSTALL SHUTOFF VALVES IN ALL DOMESTIC WATER BRANCH PIPING OFF OF THE MAINS AND IN ALL OTHER BRANCH PIPING SERVING 4 OR MORE PLUMBING FIXTURES.
8. SANITARY WASTE PIPING SHALL BE SLOPED AT 1/4" PER FT. MINIMUM UNLESS OTHERWISE NOTED.
9. STORM PIPING SHALL BE SLOPED AT 1/4" PER FT. MINIMUM UNLESS OTHERWISE NOTED.
10. INSULATE ALL WATER LINES IN ACCORDANCE WITH THE SPECIFICATIONS.
11. PIPE OPENINGS THROUGH FIRE RATED WALLS SHALL BE CAULKED WITH AN INTUMESCENT MATERIAL.

GENERAL HVAC NOTES:

1. ALL DUCTWORK IS SHOWN IN SCHEMATIC FORM. DUCT RISES AND DROPS ARE NOT SHOWN, PROVIDE OFFSETS AS REQUIRED TO MEET SPACE REQUIREMENTS AND TO AVOID INTERFERENCE WITH OTHER TRADES.
2. COORDINATE FINAL LOCATIONS OF NEW DUCTWORK AND MECHANICAL EQUIPMENT WITH LIGHTING, STRUCTURE, PIPING, SPRINKLER, DUCTWORK, ETC. PROVIDE OFFSETS, EASEMENTS OR RELOCATE DUCT AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL TRADES.
3. DIFFUSERS, GRILLES, AND REGISTER LOCATIONS SHALL BE COORDINATED WITH ARCHITECT'S REFLECTED CEILING PLANS AND ELECTRICAL LIGHTING PLANS.
4. ALL AUTOMATIC DAMPERS, FIRE DAMPERS, SMOKE DAMPERS, DAMPER OPERATORS, REHEAT COILS, ETC. SHALL BE LOCATED ABOVE CEILINGS OR OTHER CONCEALED ACCESSIBLE LOCATIONS WHERE DROP CEILINGS ARE PRESENT. LOCATE AND ARRANGE AUTOMATIC DAMPERS, SMOKE DAMPERS, DAMPER OPERATORS, ETC. TO BE ACCESSIBLE THROUGH LAY-IN CEILINGS OR 24"x24" ACCESS DOORS. PROVIDE AN ACCESS PANEL AS SPECIFIED FOR ALL NON-ACCESSIBLE INSTALLATIONS.
5. ELBOWS SHALL BE SQUARE ELBOWS CONSTRUCTED WITH TURNING VANES. RADIUS ELBOWS WITH CENTERLINE RADIUS OF NOT LESS THAN 1.5 TIMES THE DUCT WIDTH, MAY BE USED WHERE SPACE CONDITIONS PERMIT OR WHERE INDICATED ON DRAWINGS.
6. CHANGE DUCT SIZES GRADUALLY. LIMIT SLOPES FOR TRANSITIONS TO A MAXIMUM OF 1 INCH CHANGE IN WIDTH FOR EVERY 3 INCHES OF LENGTH OR APPROXIMATELY 15 DEGREE. A MAXIMUM OF 30 DEGREES IS ACCEPTABLE DIRECTLY ADJACENT TO EQUIPMENT.
7. ALL BRANCH DUCT TAPS SHALL BE CONICAL FITTINGS ON ROUND MAINS AND 45° ENTRY FITTINGS ON RECTANGULAR MAINS.
8. MANUAL VOLUME DAMPERS SHALL BE PROVIDED ON ALL RETURN, SUPPLY, AND EXHAUST BRANCH DUCTS.
9. SUPPORT ALL DUCTWORK, EQUIPMENT, ETC. FROM TOP CHORD OF BAR JOISTS OR STEEL FRAMING BEAMS.
10. NO MECHANICAL SERVICES OR EQUIPMENT SHALL BE LOCATED OVER ELECTRICAL EQUIPMENT, ELEVATOR EQUIPMENT, OR TELEPHONE EQUIPMENT ROOMS.
11. ALL DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS. INCREASE SHEET METAL SIZE TO ACCOMMODATE DUCT LINER AS REQUIRED BY THE SPECIFICATIONS.
12. ALL SHEET METAL CONNECTIONS AND JOINTS SHALL BE SEALED TO SMACNA SEAL CLASS A.
13. FLEXIBLE RUNOUTS TO BE FACTORY INSULATED AND DO NOT REQUIRE FIELD INSULATION.
14. FLEXIBLE DUCTWORK SHALL BE A MINIMUM OF 36" TO A MAXIMUM OF 72" IN LENGTH.
15. PROVIDE DRAWBANDS AND DUCT TAPE ON ALL ROUND FLEXIBLE DUCT CONNECTIONS.
16. FABRICATE AND SUPPORT DUCTWORK IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE, AND AS INDICATED.
17. FIRE DAMPERS SHALL BE INSTALLED AS REQUIRED IN ALL DUCTS PENETRATING FIRE WALLS. PROVIDE FIRESTOPPING, ETC. AS REQUIRED.
18. DUCT PRESSURE CLASSIFICATIONS
 - A. UNLESS NOTED OTHERWISE, RECTANGULAR AND ROUND SUPPLY DUCTWORK SHALL BE CONSTRUCTED AND REINFORCED TO MAINTAIN STRUCTURAL INTEGRITY AT PRESSURES AS HIGH AS + 2 IN. W.G.
 - B. RECTANGULAR AND ROUND RETURN DUCTWORK AND ALL EXHAUST DUCTWORK SHALL BE CONSTRUCTED AND REINFORCED TO MAINTAIN STRUCTURAL INTEGRITY AT NEGATIVE PRESSURES AS LOW AS - 2 IN. W.G.
19. PROVIDE MANUAL VOLUME DAMPER UPSTREAM OF EACH EXHAUST AND SUPPLY GRILLE FOR BALANCING. DAMPER MATERIAL SHALL MATCH ADJACENT DUCTWORK. DAMPERS SHALL BE PROVIDED AT EACH GRILLE AND REGISTER REGARDLESS OF WHETHER THEY ARE DEPICTED ON THE DRAWINGS OR NOT.

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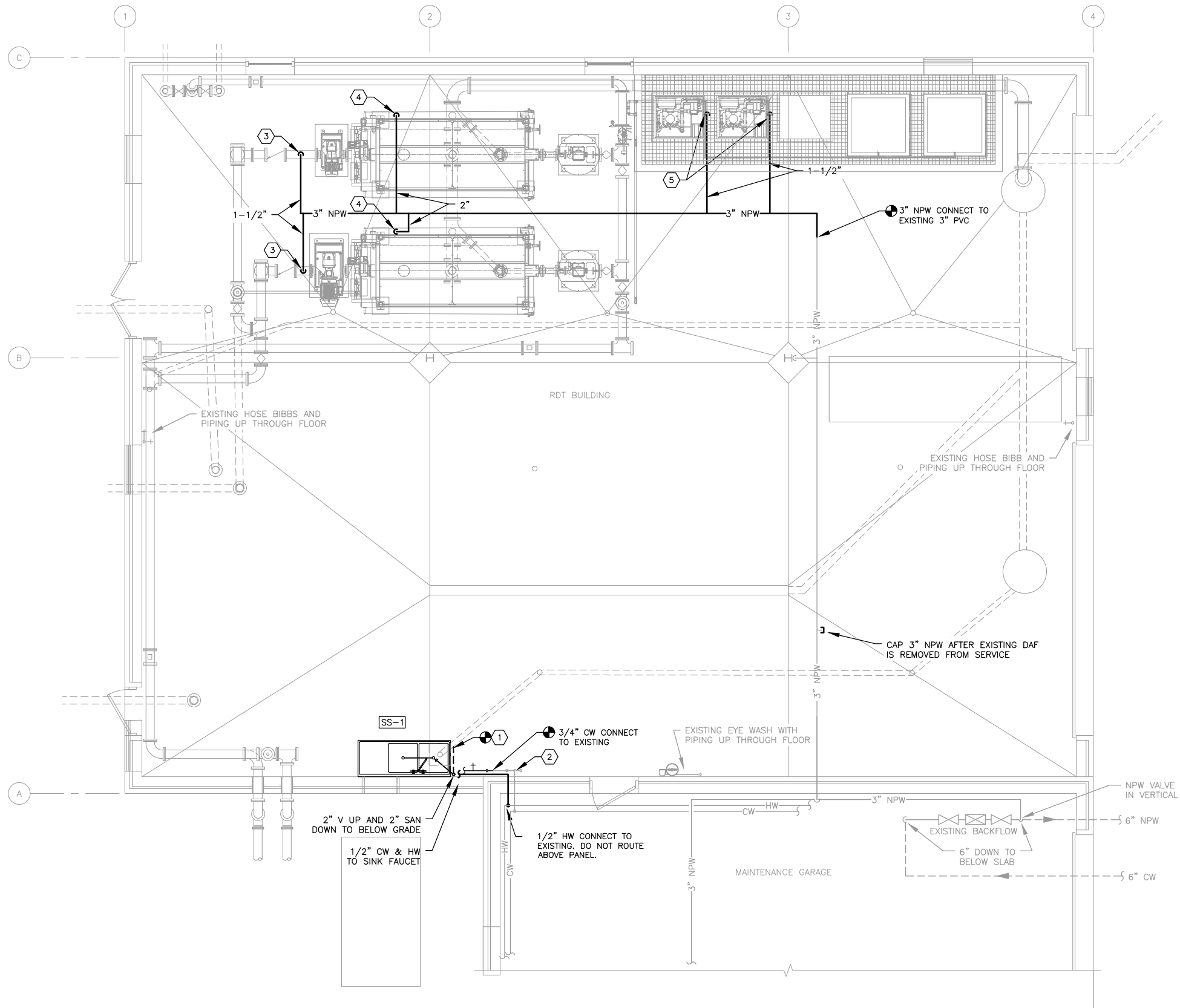
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

MECHANICAL
MECHANICAL LEGEND & ABBREVIATIONS

SHEET NO.
M.000



- GENERAL NOTES:
- SEE PLUMBING FIXTURE SCHEDULE ON SHEET M600 FOR PIPE CONNECTION SIZES NOT SHOWN ON DRAWINGS.

- KEYNOTES: (hexagon symbol)
- CUT SLAB AS REQUIRED FOR CONNECTION TO EXISTING UNDERFLOOR SANITARY DRAIN PIPING. REFER TO STRUCTURAL FOR REPAIR.
 - PROTECT AND REUSE DOMESTIC WATER PIPING ROUTED UNDER SLAB TO OTHER FIXTURES. RELOCATE HOSE BIBB AS REQUIRED FOR INSTALLATION OF NEW SINK.
 - 1-1/2" NPW DOWN TO FLUSHING WATER VALVE. SEE DETAIL 5/P.501.
 - 2" NPW DOWN TO RDT WASHWATER BOOSTER PUMP. COORDINATE WITH RDT MANUFACTURER FOR LOCATION AND CONNECTION REQUIREMENTS.
 - 1-1/2" NPW DOWN TO EACH POLYMER FEEDER BLENDER. PROVIDE VALVE AT CONNECTION. SEE SHEET P.200 FOR CONNECTION LOCATION.

1 GROUND FLOOR PLUMBING PLAN
SCALE: 1/4" = 1'-0"



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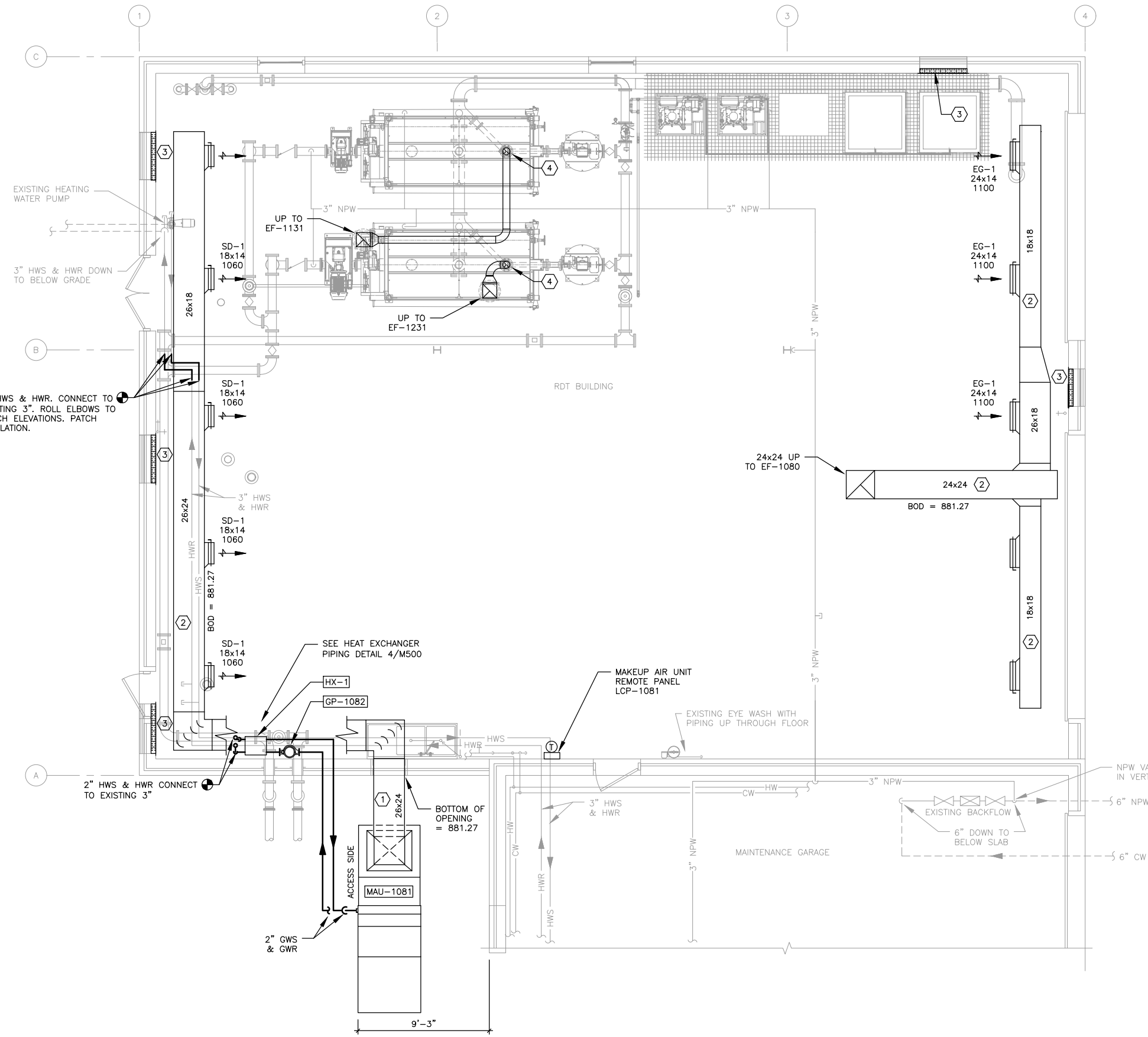
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

MECHANICAL
RDT BUILDING PLUMBING PLAN

SHEET NO.
M.100



- GENERAL NOTES:
1. CONTRACTOR SHALL VERIFY ALL DUCTWORK ROUTING PRIOR TO FABRICATION. FINAL LOCATION OF DUCTWORK SHALL BE COORDINATED WITH NEW STRUCTURE, PIPING, ELECTRICAL, LIGHTING, ETC.
 2. PROVIDE BALANCING DAMPERS ON ALL DUCT TAKE-OFF TO DIFFUSERS, GRILLES, AND REGISTERS

- KEY NOTES: ☞
1. EXTERIOR DUCTWORK SHALL BE INSULATED PER SPECIFICATIONS.
 2. SUPPLY AND EXHAUST DUCTWORK SHALL BE STAINLESS STEEL. DAMPERS, DUCTWORK HANGERS, HANGER RODS, ETC. SHALL BE STAINLESS STEEL.
 3. BLANK OFF UNUSED LOUVER WITH DOUBLE WALL PANELS CONSTRUCTED OF THE SAME MATERIAL AS THE SPECIFIED DUCTWORK AND INSULATED WITH SAME RIGID INSULATION SPECIFIED FOR EXTERIOR DUCTWORK. SEAL AIRTIGHT.
 4. 6"Ø EXHAUST DUCT FROM RDT UP TO EXHAUST FAN ON ROOF. COORDINATE DUCT CONNECTION SIZE AND REQUIREMENTS WITH RDT MANUFACTURER.

1 GROUND FLOOR HVAC PLAN
SCALE: 1/4" = 1'-0"



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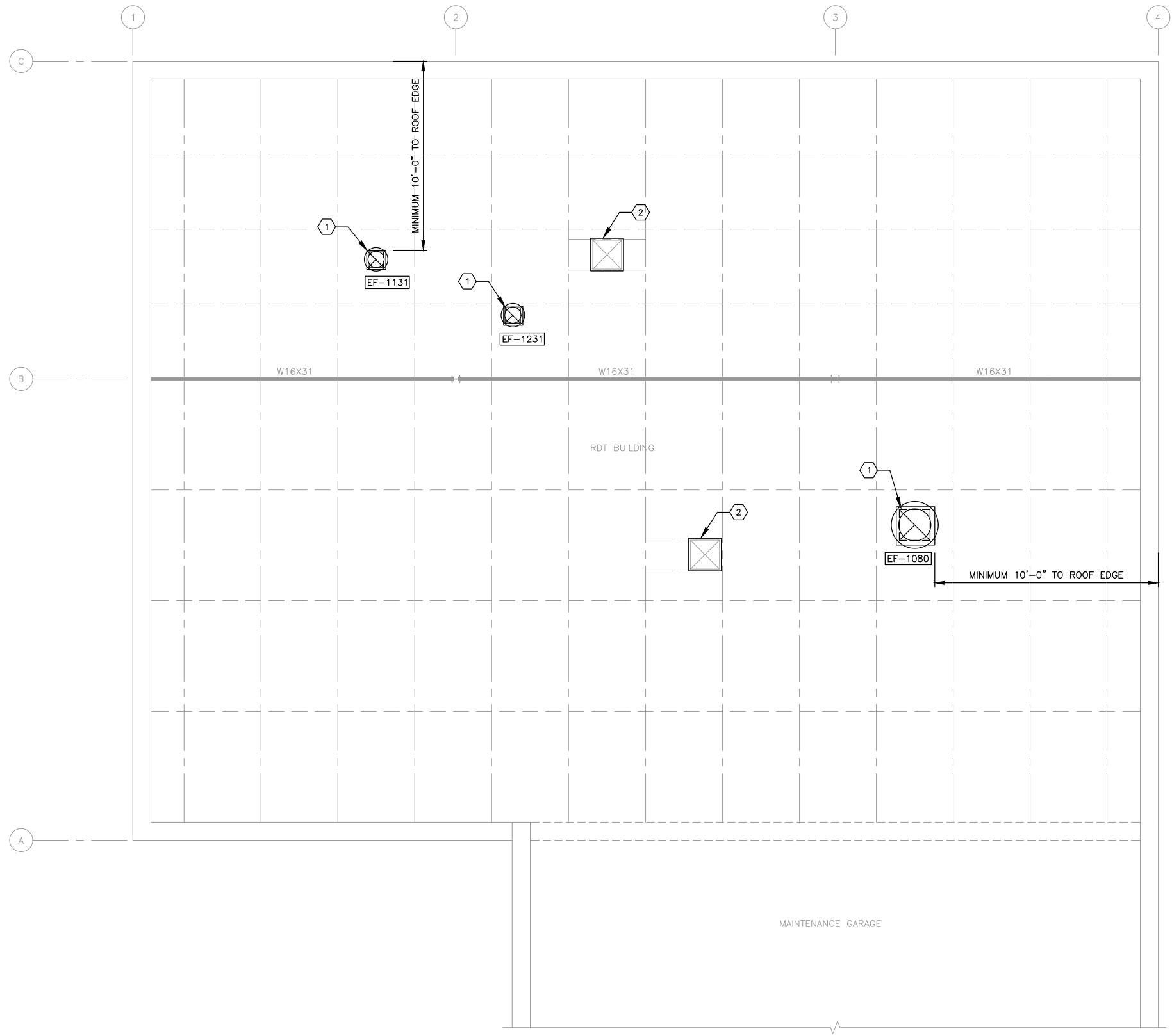
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

MECHANICAL
RDT BUILDING HVAC PLAN

SHEET NO.
M.101



- KEY NOTES:
1. NEW ROOF PENETRATION. SEE DETAIL 2/S.502.
 2. PROVIDE INSULATED ROOF CAP OVER ABANDONED ROOF CURB. SEE DETAIL 6/M.500.

1 ROOF HVAC PLAN
SCALE: 1/4" = 1'-0"



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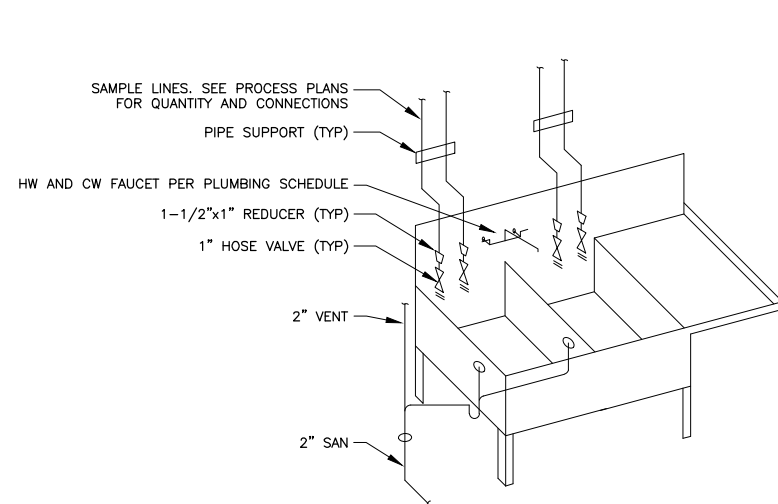


WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

MECHANICAL
ROOF PLAN

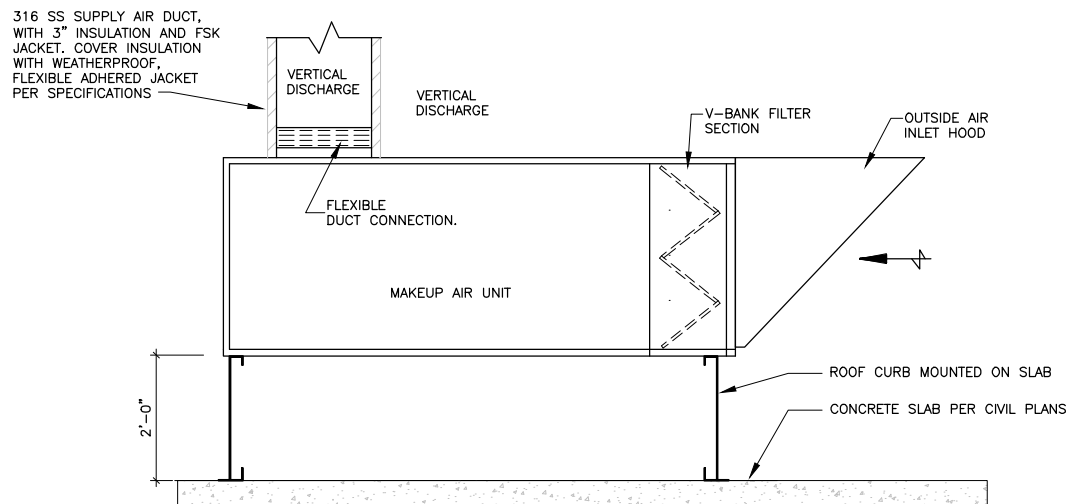
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Xrefs: xgl-1-dm01: XAX-0-P01A: XMH-1-P02: XS-0-GRID



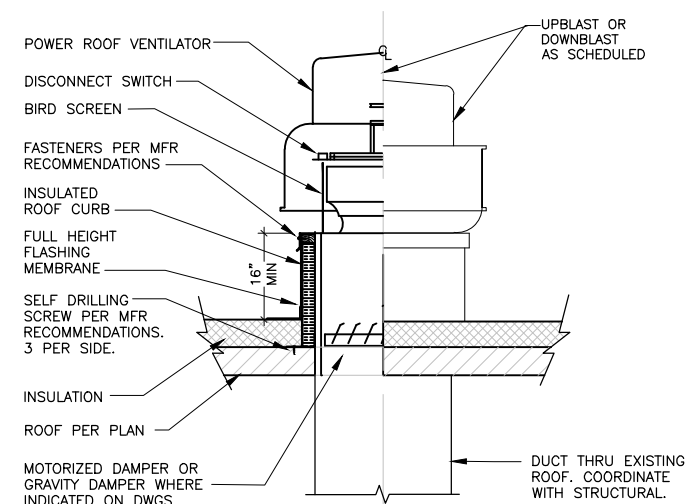
1 SAMPLE SINK PIPING

NTS
SEE PLUMBING FIXTURE AND PLUMBING FIXTURE
PIPING CONNECTION SCHEDULES



2 MAKEUP AIR UNIT DETAIL

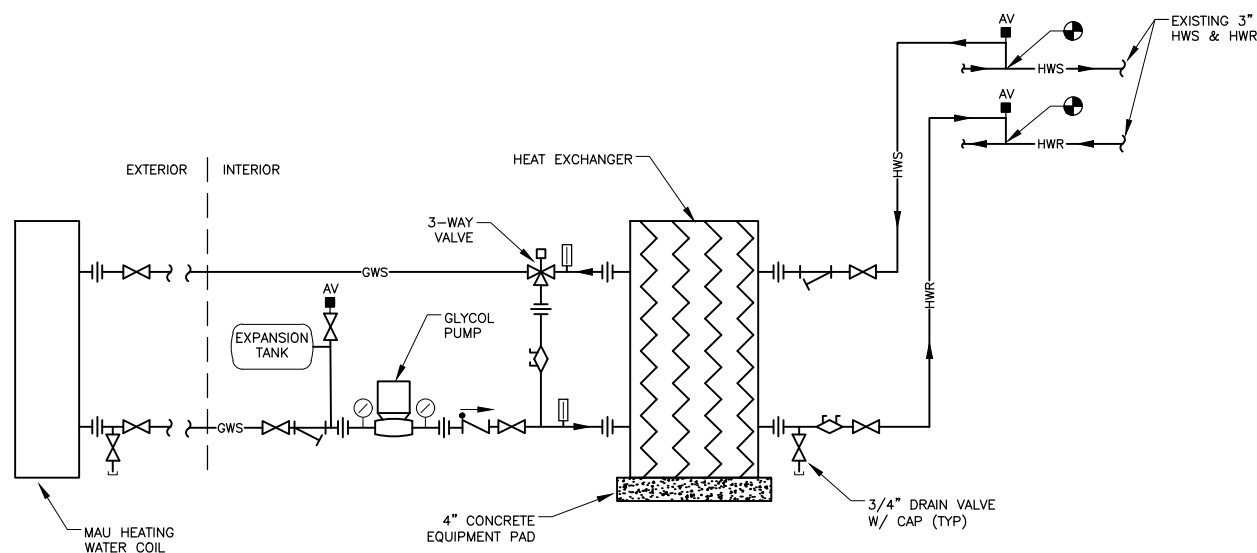
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3 ROOF MOUNTED EXHAUST FAN

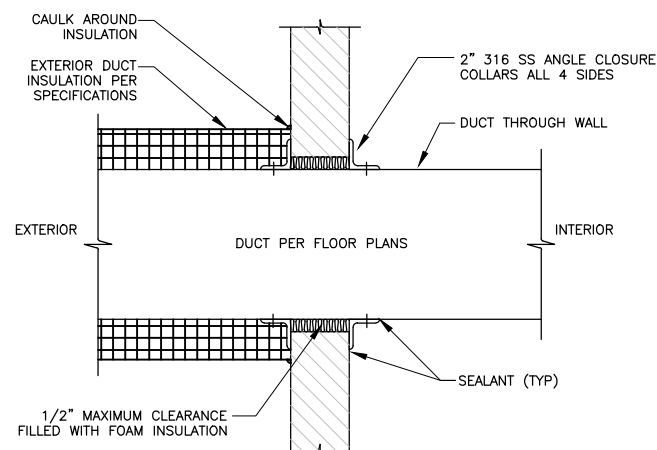
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- NOTES:
1. FLASHING MEMBRANE SHALL MATCH EXISTING ROOF MEMBRANE.
 2. ADHERE MEMBRANE WITH COMPATIBLE MATERIALS PER MANUFACTURER'S RECOMMENDATIONS.
 3. PATCH OR REPAIR ROOFING INSULATION AND MEMBRANE TO MATCH EXISTING. LAP MEMBRANE 6" BEYOND REPAIR AREA.



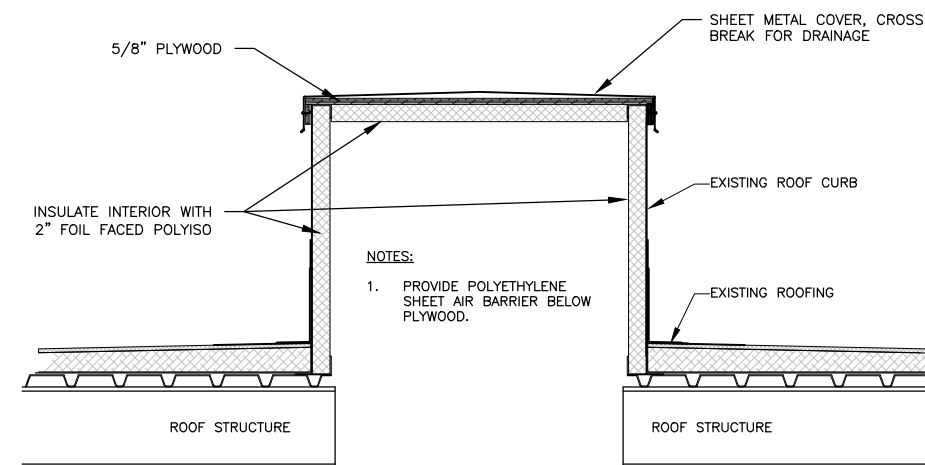
4 HEAT EXCHANGER PIPING DETAIL

NTS



5 WALL PENETRATION DETAIL

NTS



6 ABANDONED ROOF CURB COVER

NTS

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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

MECHANICAL
MECHANICAL DETAILS

SHEET NO.
M.500

Xrefs: xgl-1-dh01: XMH-0-002

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WPCP SLUDGE THICKENING IMPROVEMENTS

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

MECHANICAL

MECHANICAL SCHEDULES

SHEET NO.

M.600

PLUMBING FIXTURE SCHEDULE		
PLAN MARK	FIXTURE TYPE	FIXTURE DESCRIPTION
SS-1	SAMPLE SINK	AERO MANUFACTURING 2F2-2424-24R, NSF, 14 GAUGE STAINLESS STEEL WITH BACKSPASH, TWO COMPARTMENT 24"x24"x14" DEEP BOWLS, 24" DRAIN BOARD ON RIGHT SIDE. STAINLESS STEEL LEGS, STAINLESS STEEL DRAIN BASKET AND STRAINER. LEAD FREE, STAINLESS STEEL FAUCET, 12" SPOUT, QUARTER TURN HOT AND COLD CARTRIDGES WITH CROSS FLOW PREVENTION.

PLUMBING FIXTURE PIPE CONNECTION SCHEDULE					
FIXTURE	TAILPIECE	VENT	CW	HW	REMARKS
SS-1	2"	2"	1/2"	1/2"	SAMPLE SINK

MAKE-UP AIR UNIT (HOT WATER HEAT) SCHEDULE													
PLAN MARK	CFM	EXT. S.P. (IN. WC)	MOTOR				HOT WATER COIL (40% ETHYLENE GLYCOL)				PRESSURE DROP (FT HD)	MANUFACTURER AND MODEL NUMBER	NOTES
			BHP	HP	VOLTS	PHASE	CAPACITY (MBH)	AIR TEMP. °F ENT./LVG.	WATER TEMP. °F ENT./LVG.	GPM			
MAU-1081	5300	0.75	1.88	3	460	3	513.7	-15 / 74.5	180 / 153	42.3	3.6	GREENHECK MSX	SEE NOTES
NOTES:													
1. HEATING FLUID SHALL BE 40% ETHYLENE GLYCOL.							8. UNIT CONTROLS SHALL ENABLE GLYCOL PUMP AND MODULATE HEATING WATER VALVE.						
2. DOUBLE WALL INSULATED CONSTRUCTION, HINGED AND GASKETED ACCESS DOORS.							9. 24" TALL ALUMINUM CURB MOUNTED ON CONCRETE SLAB.						
3. HORIZONTAL UNIT, TOP DISCHARGE WITH MOTORIZED DAMPER.							10. HI-PRO POLYESTER COATING FOR FANS, DAMPERS, VIBRATION ISOLATORS, AND CURBS/MOUNTING EQUIPMENT. PROVIDE ALL STAINLESS STEEL FASTENERS. COIL AND INTERIOR PIPING SHALL BE PROVIDED WITH HERESITE COATED.						
4. INTAKE HOOD WITH BIRDSCREEN.							11. CONTINUOUS OPERATION.						
5. UNIT MOUNTED DISCONNECT.													
6. FACTORY MOUNTED AND WIRED SERVICE OUTLET.													
7. REMOTE PANEL WITH ROOM OVERRIDE THERMOSTAT.													

HEAT EXCHANGER SCHEDULE											
PLAN MARK	TYPE	CAPACITY (MBH)	HEATING SURFACE (SQ FT)	HEATING WATER			WATER / GLYCOL (40% EG)			MANUFACTURER AND MODEL NUMBER	NOTES
				GPM	PRESS. DROP (PSI)	WATER TEMP.(F) ENT./LVG.	GPM	PRESS. DROP (PSI)	WATER TEMP.(F) ENT./LVG.		
HX-1	PLATE & FRAME	514	92.4	35.1	3.0 MAX.	190 / 160	42.3	3.0 MAX	153 / 180	B&G BPX	SEE NOTES
NOTES: 1. 40% ETHYLENE GLYCOL ON MAKEUP AIR UNIT GLYCOL LOOP SIDE. 2. FRAME SHALL BE CAPABLE FOR ACCEPTING 10% ADDITIONAL PLATES.											

PUMP SCHEDULE									
PLAN MARK	CAPACITY GPM	HEAD FT. H2O	MOTOR				MOUNTING	MANUFACTURER AND MODEL NUMBER	NOTES
			HP	VOLTS	PHASE	RPM			
GP-1082	42.3	30	2	480	3	1800	INLINE	B & G / SERIES e-80	SEE NOTES
NOTES: 1. PUMPED FLUID IS 40% ETHYLENE GLYCOL.									

FAN SCHEDULE										
PLAN MARK	CFM	E.S.P. IN INCHES	FAN RPM	MOTOR				MOUNTING	BASIS OF DESIGN	NOTES
				BHP	HP	VOLTS	PHASE			
EF-1080	5500	0.75	1542	2.5	3	460	3	ROOF UPBLAST	GREENHECK CUE	1,2,4,5,8,9
EF-1131	115	0.75	1725	0.24	1/3	460	3	ROOF UPBLAST	GREENHECK CUE	1,3,5,6,7,8,10
EF-1231	115	0.75	1725	0.24	1/3	460	3	ROOF UPBLAST	GREENHECK CUE	1,3,5,6,7,8,10
NOTES: 1. 24" HIGH INSULATED ALUMINUM ROOF CURB. 2. FACTORY MOUNTED DISCONNECT. 3. FACTORY MOUNTED DISCONNECT, EXPLOSION PROOF. 4. FACTORY MOUNTED SPEED CONTROL 5. GRAVITY BACK DRAFT DAMPER. 6. EXPLOSION-PROOF MOTOR AND ACCESSORIES. 7. SPARK PROOF CONSTRUCTION. 8. BAKED EPOXY COAT FINISH. 9. FAN SHALL OPERATE CONTINUOUSLY. 10. OPERATION CONTROLLED BY ASSOCIATED RDT.										

GRILLE, REGISTER & DIFFUSER SCHEDULE					
PLAN MARK	DESCRIPTION	MATERIAL	FINISH	MOUNTING	DESIGN BASIS
SD-1	3/4" DOUBLE DEFLECTION	ALUMINUM	NONE	SURFACE	PRICE 620
EG-1	3/4", 0 DEG DEFLECTION	ALUMINUM	NONE	SURFACE	PRICE 630

ABBREVIATIONS		ELECTRICAL SYMBOLS		ELECTRICAL SYMBOLS		ELECTRICAL SYMBOLS PLANS	
A AC AF AFF AG AICS ASD AT ATS AWG BC C CB CO CKT CPT CT DB DC DWG ELEV ENCL EP ETM EXIST FLEX GFI GFR GND HH HOA HP HVAC HZ JB KVA KW LA LOS LS LTG MA MAX MCC MCM MIN MT MTD N NC NL NO NO NTS OL'S P PB PH PS PT PVC REF REQ'D SH SHT STD SW TACH TB TEL TEMP TSP XFMR TSP TST TSTAT TYP UG UNLESS OTHERWISE NOTED V VFD VS W WP ZS	AMPERES ALTERNATING CURRENT AMPERE FRAME ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AMPERES INTERRUPTING CAPACITY, SYMMETRICAL ADJUSTABLE SPEED DRIVE AMPERE TRIP AUTOMATIC TRANSFER SWITCH AMERICAN WIRE GAUGE BARE COPPER CONDUIT CIRCUIT BREAKER CONDUIT ONLY CIRCUIT CONTROL POWER TRANSFORMER CURRENT TRANSFORMER DIRECT BURIED DIRECT CURRENT DRAWING ELEVATION ENCLOSURE EXPLOSION PROOF ELAPSED TIME METER EXISTING FLEXIBLE GROUND FAULT INTERRUPTER GROUND FAULT RELAY GROUND HANDHOLE HAND OFF AUTOMATIC HORSEPOWER HEATING, VENTILATING, AND AIR CONDITIONING HERTZ JUNCTION BOX KILOVOLT-AMPERES KILOWATT LIGHTNING ARRESTOR LOCKOUT STOP PUSH-BUTTON LIMIT SWITCH LIGHTING MILLIAMPERE MAXIMUM MOTOR CONTROL CENTER THOUSAND CIRCULAR MILS MINIMUM EMPTY MOUNTED NEUTRAL NORMALLY CLOSED NIGHTLIGHT NORMALLY OPEN NUMBER NOT TO SCALE MOTOR OVERLOAD CONTACTS POLE PUSHBUTTON, PULLBOX PHASE PRESSURE SWITCH POTENTIAL TRANSFORMER POLYVINYL CHLORIDE REFERENCE REQUIRED SHIELDED SHEET STANDARD SWITCH TACHOMETER TERMINAL BOARD TELEPHONE TEMPERATURE TWISTED PAIR TRANSFORMER TWISTED SHIELDED PAIR TRANSFORMER TWISTED SHIELDED TRIAD THERMOSTAT TYPICAL UNDERGROUND UNLESS OTHERWISE NOTED VOLT VARIABLE SPEED DRIVE VARIABLE SPEED WATTS, WIRE WEATHERPROOF POSITION SWITCH	UTILITY METERING METERING DEVICE: AM-AMMETER VM-VOLTMETER FM-FREQUENCY METER WHM-KILOWATT HOUR METER DM-DIGITAL MULTI-FUNCTION METER MFM-MULTI-FUNCTION METER AMMETER SWITCH VOLTMETER SWITCH CURRENT TRANSFORMER, QUANTITY INDICATED POTENTIAL TRANSFORMER, QUANTITY INDICATED SWITCHGEAR DEVICE: 11 MULTIFUNCTION RELAY 21 DISTANCE RELAY 25 SYNCHRONIZING OR SYNCHRONISM CHECK DEVICE 260 TEMPERATURE RELAY 27 UNDERVOLTAGE RELAY 32 DIRECTIONAL POWER RELAY 43 MANUAL TRANSFER OR SELECTOR DEVICE 46 REVERSE-PHASE OR PHASE-BALANCE CURRENT RELAY 47 PHASE-SEQUENCE VOLTAGE RELAY 49 MACHINE OR TRANSFORMER THERMAL RELAY 50 INSTANTANEOUS OVERCURRENT OR RATE OF RISE RELAY 50G ZERO SEQUENCE GROUND FAULT RELAY 51 A-C TIME OVERCURRENT RELAY 52 A-C CIRCUIT BREAKER 59 OVERVOLTAGE RELAY 63 SUDDEN PRESSURE RELAY 65 GOVERNOR 67 A-C DIRECTIONAL OVERCURRENT RELAY 81 FREQUENCY RELAY 86 LOCKOUT RELAY 87 DIFFERENTIAL PROTECTIVE RELAY KEY INTERLOCKING OF EQUIPMENT MECHANICAL INTERLOCKING OF EQUIPMENT ELECTRICAL INTERLOCKING OF EQUIPMENT POWER FACTOR CORRECTING CAPACITOR PHASE MONITORING RELAY ELAPSED TIME METER SURGE PROTECTIVE DEVICE MULTI-FUNCTION METER REMOTE TERMINAL UNIT TERMINAL BLOCK TRIP COIL GENERATOR NEUTRAL JUNCTION NEUTRAL GROUNDING RESISTOR (NGR) SHORTING TERMINAL BLOCK SYNCH SWITCH MEDIUM VOLTAGE SURGE ARRESTOR LOW VOLTAGE CIRCUIT BREAKER (CB). RATINGS AND NO. OF POLES AS SHOWN. WHEN SPECIFIC TYPE IS REQUIRED, X INDICATES TYPE. TYPES: MCCB - MOLDED CASE ICCB - INSULATED CASE LVP - LOW VOLTAGE POWER MCP - MOTOR CIRCUIT PROTECTOR (RATING PER CONNECTED LOAD) SEPARATELY MOUNTED CIRCUIT BREAKER, SEE ELECTRICAL ONE LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION GROUND FAULT PROTECTION	52 FUSE, SIZE AND NUMBER OF FUSES AS NOTED FUSED CUTOUT, CURRENT RATING, FUSE SIZE AND NUMBER OF POLES AS NOTED FUSIBLE SWITCH, CURRENT RATING, FUSE SIZE AND QUANTITY AS NOTED NON-FUSED SWITCH, CURRENT RATING AND NUMBER OF POLES AS NOTED DISCONNECT OR DRAWOUT CONNECTION TYPE/SIZE FEATURES MOTOR CONTROLLER SUCCEEDING NUMBER INDICATES NEMA STARTER SIZE FVR = FULL VOLTAGE REVERSING FNVR = FULL VOLTAGE NON-REVERSING RVSS = REDUCED VOLTAGE SOFT STARTER VFD = VARIABLE FREQUENCY DRIVE 2S2W = TWO-SPEED TWO-WINDING 2S1W = TWO SPEED ONE-WINDING FEATURES 1 - CONTROL POWER TRANSFORMER, 120V SECONDARY 2R - 2: DENOTES INDICATING LIGHT MODIFIER: R - RED G - GREEN A - AMBER W - WHITE 3A - 3: DENOTES CONTROL SWITCH MODIFIER: A - HAND-OFF-AUTO B - HAND-OFF-REMOTE C - ON-OFF D - FORWARD-OFF-REVERSE 4 - START-STOP PUSHBUTTONS, MOMENTARY 5 - ELAPSED TIME METER 6 - KEYPAD/DISPLAY ON DOOR 7 - OUTPUT dv/dt FILTER 8 - DISCONNECT SWITCH THERMAL OVERLOAD ELEMENT THERMAL OVERLOAD RELAY CONTACT MOTOR WITH DESIGN HORSEPOWER (WHEN INDICATED) GENERATOR TRANSFER SWITCH, CURRENT RATING AND NUMBER OF POLES AS NOTED. ATS - AUTOMATIC MTS - MANUAL TRANSFORMER Δ 3 PHASE, 3 WIRE DELTA CONNECTION Y 3 PHASE, 4 WIRE GROUNDED WYE CONNECTION SWITCHBOARD OR PANELBOARD. NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED. DELTA CONNECTION WYE CONNECTION GROUNDED WYE CONNECTION MANUAL MOTOR STARTER MOTOR OVERLOAD HEATER CONTACTS MOTOR OVERLOAD HEATER SOLENOID OPERATED VALVE MOTOR ALARM FUSE CONTROL POWER TRANSFORMER GROUND WIRING IN MOTOR STARTER FIELD WIRING	CEILING/PENDANT MOUNTED FIXTURE CEILING/PENDANT MOUNTED FIXTURE, EMERGENCY/NIGHT LIGHT WALL MOUNTED FIXTURE CEILING/PENDANT MOUNTED FIXTURE WALL MOUNTED FIXTURE CEILING/PENDANT MOUNTED FIXTURE, EMERGENCY/NIGHT LIGHT WALL MOUNTED FIXTURE, EMERGENCY/NIGHT LIGHT EXIT LIGHT, CEILING MOUNTED, ARROW DIRECTION AS INDICATED. SHADED SECTION INDICATES ILLUMINATION FACE. EXIT LIGHT, WALL MOUNTED, ARROW DIRECTION AS INDICATED. SHADED SECTION INDICATES ILLUMINATION FACE. EMERGENCY LIGHT FIXTURE, 2 ATTACHED HEADS AS SHOWN EMERGENCY LIGHT, REMOTE MOUNTED HEAD FIRE ALARM SYSTEM MANUAL PULL STATION, 48" ABOVE FLOOR VISUAL ALARM LIGHT 80" ABOVE FLOOR OR AS NOTED AUDIBLE ALARM DEVICE WITH VISUAL ALARM LIGHT 80" ABOVE FLOOR OR AS NOTED COMBINATION AUDIBLE ALARM DEVICE AND VISUAL ALARM LIGHT 80" ABOVE FLOOR, AND MANUAL PULL STATION 48" ABOVE FLOOR GENERAL ALARM BELL 80" ABOVE FLOOR OR AS NOTED VISUAL ALARM LIGHT 80" ABOVE FLOOR, AND MANUAL PULL STATION 48" ABOVE FLOOR. THERMAL FIRE DETECTOR, COMBINATION RATE OF RISE AND FIXED TEMPERATURE. '200' INDICATES 200 DEGREE FIXED TEMPERATURE. '135' INDICATES 135 DEGREE FIXED TEMPERATURE. 'ST' INDICATES DETECTOR TO INITIATE ELEVATOR C.B. SHUNT-TRIP. AUTOMATIC DOOR RELEASE CONNECTION SMOKE DAMPER CONNECTION SMOKE DETECTOR ON CEILING: 'D'-INDICATES DUCT DETECTOR TYPE 'R'-INDICATES RELAY FOR AUXILIARY CONTROLS 'ER' INDICATES DETECTOR TO INITIATE ELEVATOR RECALL 'PT' INDICATES PROJECTED BEAM TYPE TRANSMITTER 'PR' INDICATES PROJECTED BEAM TYPE RECEIVER FAN SHUT-DOWN CONNECTION REMOTE DETECTOR INDICATOR LIGHT DUCT SMOKE DETECTOR REMOTE TEST/RESET STATION SPRINKLER FLOW SWITCH CONNECTION TAMPER-PROOF SPRINKLER VALVE SWITCH CONNECTION FIRE ALARM ZONE ANNUNCIATOR FIRE ALARM MASTER ANNUNCIATOR FIRE ALARM CONTROL PANEL TELEPHONE STATION GAS DETECTOR SENSOR FIRE ALARM ZONE LIGHTING CONTROL STATION, PAD MOUNTED LIGHTING CONTROL STATION, POLE MOUNTED HAND HOLE JUNCTION BOX UTILITY TRANSFORMER, PAD MOUNTED UTILITY TRANSFORMER, POLE MOUNTED PHOTOCELL MAN HOLE UNDERGROUND CONDUIT POLE MOUNTED LIGHTING UNIT, AS SPECIFIED BACK MOUNTED LIGHTING UNIT, AS SPECIFIED TOWER LIGHTING UNIT, AS SPECIFIED ATHLETIC FIELD LIGHTING UNIT, AS SPECIFIED	CONDUIT, RACEWAY AND WIRING CONDUIT TURNING UP CONDUIT TURNING DOWN HOME RUN TO PANEL, 2 #12, 1 #12G IN 3/4" C UNLESS OTHERWISE NOTED CIRCUIT RUN BETWEEN DEVICES EXPOSED IN NON-ARCHITECTURALLY FINISHED AREAS, CONCEALED IN ARCHITECTURALLY FINISHED AREAS. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT. CONDUIT RUN BETWEEN DEVICES CONCEALED IN NON-ARCHITECTURALLY FINISHED AREAS OR UNDER FLOOR SLAB. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT. CIRCUIT CONTINUATION CONDUIT STUBBED OUT AND CAPPED CONDUIT TAG OR CIRCUIT NUMBER - WIRE AND CONDUIT SIZE AS SPECIFIED IN CIRCUIT SCHEDULE ON THE SHEETS PLUG IN STRIP-TYPE RECEPTACLES OR OTHER OUTLETS AS INDICATED LAY IN WIREWAY DUCT, SIZE AS NOTED FEEDER DUCT-RATING AND NUMBER OF CONDUCTORS AS NOTED PLUG IN DUCT-RATING AND NUMBER OF CONDUCTORS AS NOTED CABLE TRAY, TYPE AS NOTED CONDUIT TAGS A. GRS: GALVANIZED RIGID STEEL B. RAC: RIGID ALUMINUM CONDUIT C. PVC-GRS: PVC COATED GALVANIZED RIGID STEEL CONDUIT D. PVC: RIGID POLYVINYL CHLORIDE CONDUIT (THINWALL) E. EMT: ELECTRICAL METALLIC TUBING CONDUIT F. LFMC: LIQUIDTIGHT FLEXIBLE METAL CONDUIT G. HDPE: HIGH DENSITY POLYETHYLENE CONDUIT H. FMC: FLEXIBLE METAL CONDUIT COMMUNICATIONS SYSTEM SPEAKER OUTLET RECESSED IN CEILING (UNLESS NOTED OTHERWISE). 'S'-INDICATES SURFACE TYPE, 'C'-INDICATES SPEAKER CONCEALED ABOVE CEILING, 'P'-INDICATES PROJ. HORN TYPE, 'DF'-INDICATES DOUBLE FACE TYPE TELEPHONE OUTLET, IN WALL 16" ABOVE FLOOR OR AS NOTED. 'W' INDICATES WALL MOUNTED TELEPHONE AT 54" COMPUTER TERMINAL OUTLET-IN WALL OR AS NOTED COMBINATION TELEPHONE & COMPUTER TERMINAL OUTLET IN WALL 16" ABOVE FLOOR OR AS NOTED TELEPHONE OUTLET, IN FLOOR BOX VOLUME CONTROL, NUMERAL DESIGNATES ASSOCIATED SPEAKERS GROUNDING GROUND GRID CONDUCTOR (SIZE PER DWG.) GROUND ROD GROUND SYSTEM TEST WELL EXOTHERMIC WELDED GROUND CONNECTION EQUIPMENT GROUND CABLE STUB-UP MAIN GROUND BAR SITE LIGHTING CONTROL STATION, PAD MOUNTED LIGHTING CONTROL STATION, POLE MOUNTED HAND HOLE JUNCTION BOX UTILITY TRANSFORMER, PAD MOUNTED UTILITY TRANSFORMER, POLE MOUNTED PHOTOCELL MAN HOLE UNDERGROUND CONDUIT POLE MOUNTED LIGHTING UNIT, AS SPECIFIED BACK MOUNTED LIGHTING UNIT, AS SPECIFIED TOWER LIGHTING UNIT, AS SPECIFIED ATHLETIC FIELD LIGHTING UNIT, AS SPECIFIED	WIRING DEVICE CLOCK HANGER RECEPTACLE-20A, 125V, 2P, 3W (NEMA 5-20R), IN WALL +84" OR AS NOTED SIMPLEX RECEPTACLE - 125V, 2P, 3W 20A, 30A, OR 50A AT OUTLET INDICATES AMP. RATING (NEMA 5-20R, 5-30R, OR 5-50R), IN WALL OR AS NOTED DUPLEX RECEPTACLE-20A, 125V, 2P, 3W (NEMA 5-20R), IN WALL DUPLEX RECEPTACLE-20A, 125V, 2P, 3W (NEMA 5-20R) IN CEILING DUPLEX RECEPTACLE-20R, 125V, 2P,3W (NEMA 5-20R), IN WALL ABOVE COUNTER TOP OR BACK SPLASH 'GFI'-INDICATES GROUND FAULT INTERRUPTER TYPE 'SS'-INDICATES SURGE SUPPRESSER TYPE 'IG'-INDICATES ISOLATED GROUND TYPE DUPLEX RECEPTACLE-20R, 125V, 2P, 3W (NEMA 5-20R), IN WALL OR AS NOTED, ONE RECEPTACLE HOT, ON RECEPTACLE SWITCH FLOOR OUTLET BOX WITH SIMPLEX RECEPTACLE-20A, 125V, 2P, 3W (NEMA 5-20R) FLOOR OUTLET WITH DUPLEX RECEPTACLE OUTLET WITH SPECIAL DEVICE AS NOTED, IN WALL OUTLET WITH SPECIAL DEVICE AS NOTED, IN FLOOR OUTLET WITH SPECIAL DEVICE AS NOTED, IN CEILING JUNCTION BOX OR OUTLET BOX SINGLE POLE WALL SWITCH: # - INDICATES 2-WAY, 3-WAY OR 4-WAY PL - PILOT LIGHT L/T - LOCKING TYPE LV - LOW VOLTAGE TYPE T - TIMER MC - MOMENTARY CONTACT PULL BOX PUSHBUTTON, AS NOTED LOCAL LIGHT DIMMER, M INDICATES MASTER CONTROLLER 1000 INDICATES 1000 WATTS 1500 INDICATES 1500 WATTS 2000 INDICATES 2000 WATTS MOTOR SPEED CONTROLLER 2-SPEED, 3-SPEED OR VARIABLE SPEED AS INDICATED MAGNETIC DOOR HOLD EQUIPMENT MOTOR CONNECTION EQUIPMENT TERMINAL POINT SAFETY DISCONNECT SWITCH, NON-FUSED UNLESS NOTED (F) MOTOR RATED SWITCH, NO. OF POLES AS REQUIRED. FUSE HOLDER WITH FUSESTAT AND TOGGLE SWITCH MOTOR STARTER-MAGNETIC UNLESS NOTED MAN. (MANUAL) COMBINATION MOTOR STARTER AND FUSED DISCONNECT SWITCH-MAGNETIC STARTER COMBINATION MOTOR STARTER AND NON-FUSED DISCONNECT SWITCH-MAGNETIC STARTER BRANCH CIRCUIT PANELBOARD SURFACE MOUNTED BRANCH CIRCUIT PANELBOARD FLUSH MOUNTED SPECIAL CABINET OR EQUIPMENT AS NOTED SURFACE MOUNTED SPECIAL CABINET OR EQUIPMENT AS NOTED FLUSH MOUNTED DRY-TYPE TRANSFORMER, NUMBER INDICATES KVA SIZE POWER DISTRIBUTION PANELBOARD SURFACE MOUNTED OR FREESTANDING, AS NOTED POWER DISTRIBUTION PANELBOARD, ELECTRICAL EQUIPMENT MOUNTED ON SWITCHBOARD, FLUSH MOUNTED AUTOMATIC TRANSFER SWITCH MANUAL TRANSFER SWITCH CONTROL STATION LIGHTING CONTACTOR	SECURITY SYSTEM KEYPAD STATION KEYPAD ACCESS CONTROL CARD ACCESS READER COMBINATION KEYPAD ACCESS CONTROL & CARD ACCESS READER GLASS BREAK SENSOR SECURE DOOR. ELECTRICAL STRIKE & CONTACTS AS SCHEDULED SECURE WINDOW SECURITY MOTION SENSOR, AS INDICATED SECURITY ACCESS PROXIMITY SENSOR CLOSE CIRCUIT TELEVISION CAMERA FIXED MOUNTED CLOSED CIRCUIT TELEVISION CAMERA REMOTE PAN, TILT, & CONTROL DOOR CABINET SECURITY EQUIPMENT CONTROL PANEL VENTILATION ALARM SYSTEM HORN STROBE PUSHBUTTON ENCLOSURE W/ PILOT LIGHTS MISCELLANEOUS THERMOSTAT 48" ABOVE FLOOR. PHOTOCELL CONTROL ELECTRIC HAND DRYER AS NOTED. REFERENCED NOTE TIME SWITCH TELECOMMUNICATIONS MAIN GROUND BAR AT 80" OR AS NOTED. TELECOMMUNICATIONS GROUND BAR. 'XX' INDICATES GROUND BAR NUMBER. OCCUPANCY SENSOR, CEILING MOUNTED OCCUPANCY SENSOR, WALL MOUNTED, 48" ABOVE FLOOR SPECIAL SYSTEM WIRING TO CENTRAL EQUIPMENT, PANEL, TERMINAL CABINET OR NEXT DEVICE. EM = EMERGENCY SYSTEM FO = FIBER OPTIC MVE = MEDIUM VOLTAGE ELECTRICAL E = ELECTRIC AS NOTED GF = CIRCUIT TO GROUND FAULT CIRCUIT BREAKER EIL = EQUIPMENT INTERLOCK MT = EMPTY CONDUIT NOTES 1. ALL WALL RECEPTACLES, TELEPHONE OUTLETS OR SIMILAR OUTLETS TO BE 16" ABOVE FLOOR TO BOTTOM UNLESS OTHERWISE INDICATED. 2. ALL WALL SWITCHES, PUSHBUTTONS AND DIMMERS TO BE 48" ABOVE FLOOR TO BOTTOM UNLESS OTHERWISE INDICATED. 3. UPPER CASE LETTERS 'XX' AT DEVICE INDICATES AS NOTED; DD = DOUBLE DUPLEX RECEPTACLES IN TWO GANG BOX IG = ISOLATED GROUND TYPE SS = SURGE SUPPRESSION TYPE GFI = GROUND FAULT INTERRUPTER TYPE WP = WEATHERPROOF XP = EXPLOSION PROOF TL = TWIST LOCK TYPE WG = WIREGUARD TO BE PROVIDED RI = ROUGH-IN ONLY 4. LOWER CASE LETTERS AT SWITCHES AND FIXTURES INDICATE ASSOCIATED UNITS FOR SWITCHING. 5. UPPER CASE LETTERS AT FIXTURE INDICATE FIXTURE TYPE. 6. NUMBER AT FIXTURE OR OUTLET INDICATES PANEL CIRCUIT NUMBER. 7. PLUS (+) SIGN WITH DIMENSION AT OUTLET INDICATES HEIGHT ABOVE FINISHED FLOOR LINE OR HEIGHT ABOVE FINISHED GRADE.

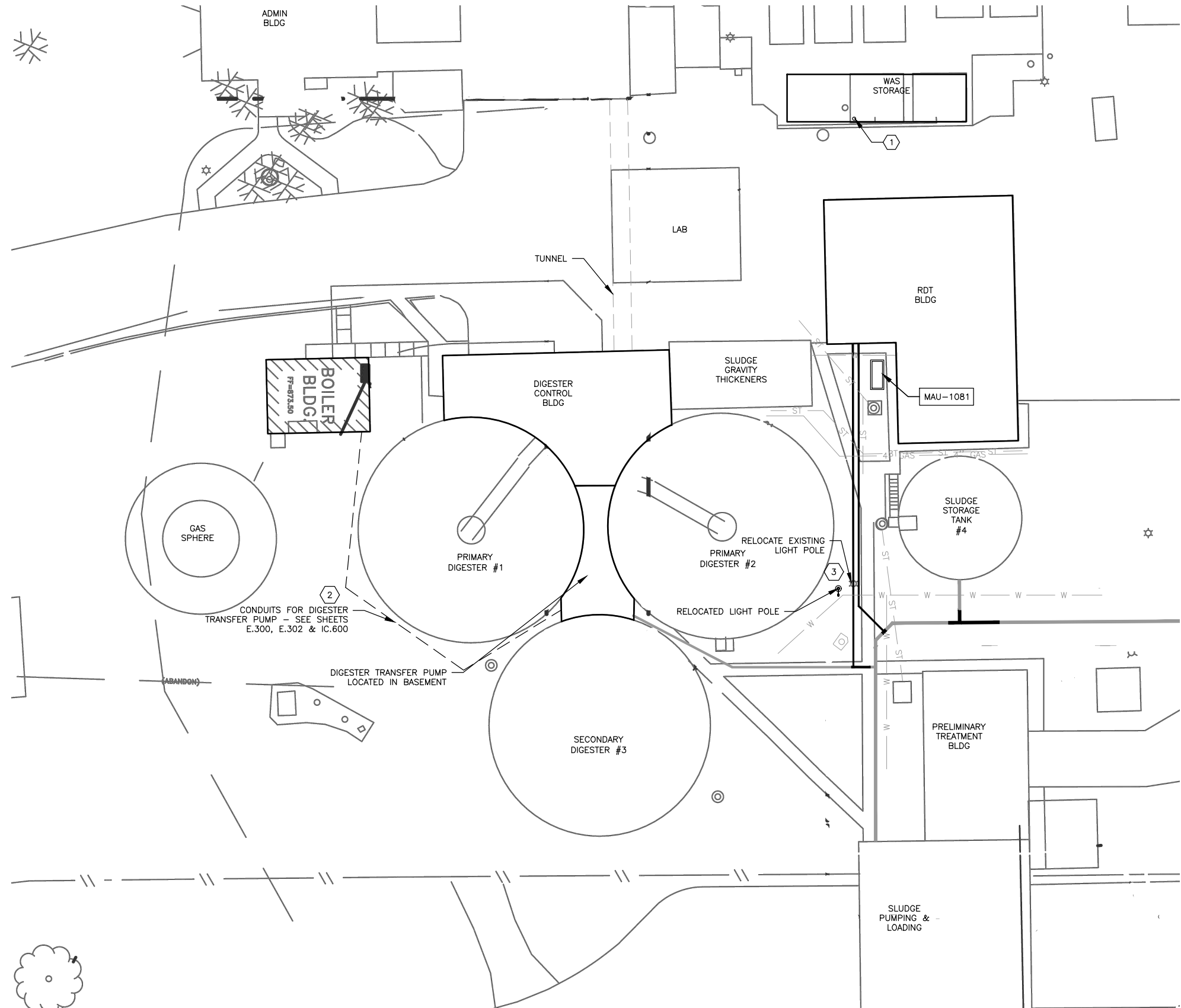
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NO.	DATE	BY	REVISION	DESCRIPTION

WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

ELECTRICAL
ELECTRICAL LEGEND & ABBREVIATIONS

SHEET NO.
E.000



- GENERAL NOTES:
1. REFER TO D-SERIES SHEETS FOR EL3ECTRICAL DEMO ITEMS.
- KEY NOTES:
1. WAS STORAGE PUMPS TO BE REPLACED SEE SHEET E.400 FOR DETAILS.
 2. CONDUIT ROUTING SHOWN IS FOR DIAGRAMMATIC PURPOSE ONLY. COORDINATE FINAL ROUTING WITH EXISTING CONDITIONS. REFER TO DETAIL 1/E.502 FOR CONDUIT BURIAL INFORMATION. REFER TO SHEETS E.300 AND E.302 FOR CONTINUATION OF CONDUCTORS AND CABLES.
 3. DISCONNECT AND RELOCATE EXISTING LIGHT POLE AND LUMINAIRE. DEMOLISH EXISTING POLE BASE RO 24" BELOW FINISH GRADE. REINSTALL LIGHT POLE AND LUMINAIRE AT NEW LOCATION INDICATED. PROVIDE NEW POLE BASE PER DETAIL 4/E.501. INTERCEPT EXISTING LIGHTING CIRCUIT CONDUIT AND CONDUCTORS WITH 12"x12" (MIN) GROUND BOX(ES) AS REQUIRED AND EXTEND NEW CONDUIT AND CONDUCTORS TO NEW POLE LOCATION. MATCH EXISTING SIZES (FIELD VERIFY).

1 ELECTRICAL SITE PLAN
SCALE: 1"=20'

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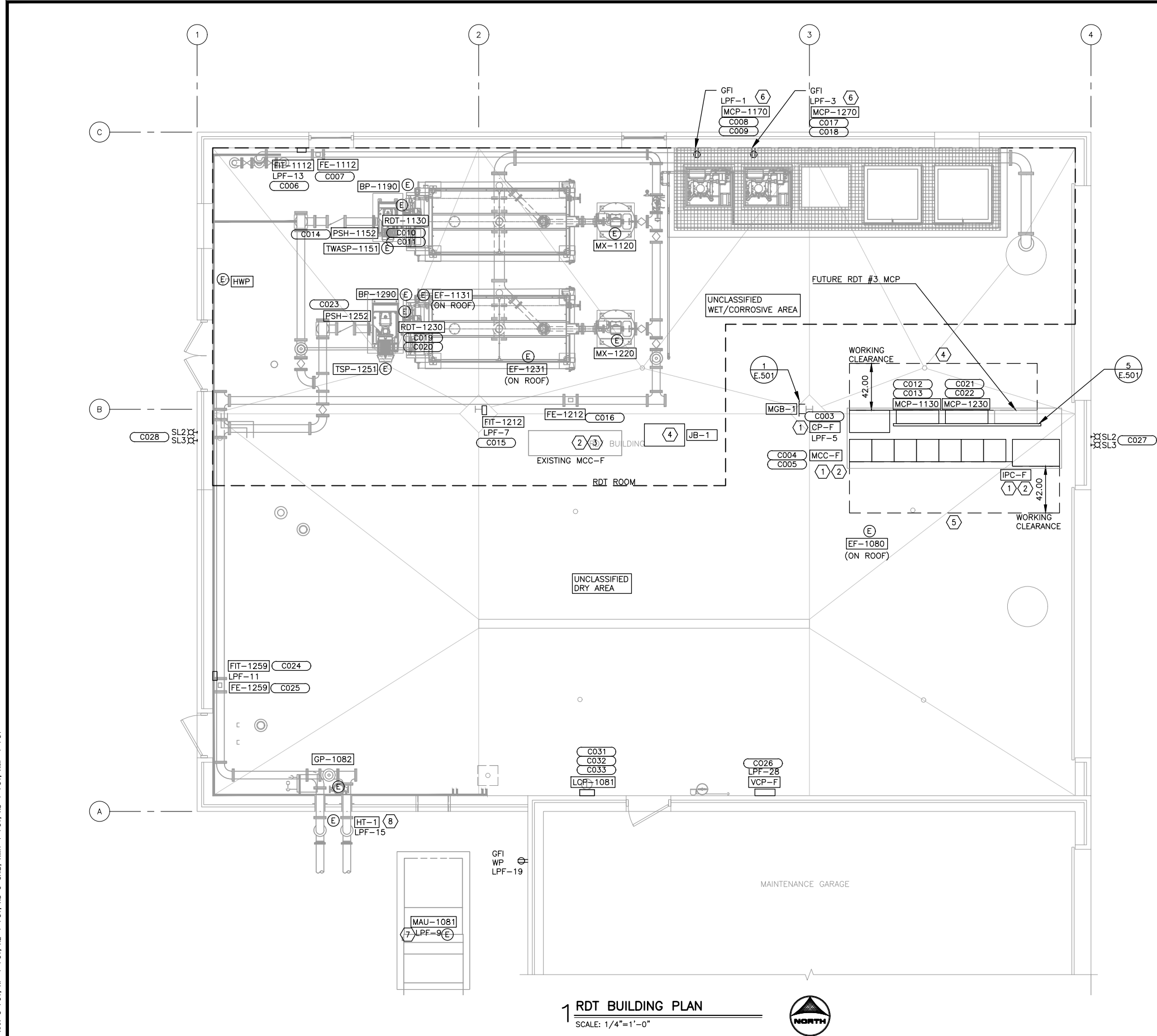
WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

ELECTRICAL
ELECTRICAL SITE PLAN

SHEET NO.
E.001

Xrefs: xgt-1.dgn01: XC-0-SITE; xg-0-DD0-legends

- KEY NOTES: (#)
1. PROVIDE CONCRETE EQUIPMENT PAD FOR MCC-F AND IPC-F IN ACCORDANCE WITH STRUCTURAL DRAWINGS.
 2. EXTEND ALL CONDUITS AND CONDUCTORS, FOR EXISTING EQUIPMENT AND DEVICES, FROM PREVIOUS LOCATION OF MCC-F TO NEW MCC-F. MATCH CONDUIT AND CONDUCTOR SIZES WITH EXISTING AND CONNECT TO MCC-F, PANEL PPF AND PANEL LPF AS SHOWN ON ONE LINE DIAGRAM AND PANEL SCHEDULES.
 3. EXISTING MCC-F LOCATION:
PROVIDE JUNCTION BOXES ON CEILING (ABOVE EXISTING MCC-F) AS REQUIRED TO ROUTE BRANCH CIRCUITS THAT WILL BE MOVED FROM EXISTING MCC-F TO NEW MCC-F. SPLICE EXISTING CONDUCTORS TO NEW CONDUCTORS WITHIN JUNCTION BOXES. MATCH EXISTING CONDUIT AND CONDUCTOR SIZES. REFER TO PANEL SCHEDULES AND ONE-LINE DIAGRAM FOR EXISTING CIRCUITS THAT ARE TO REMAIN. REMOVE CONDUITS AND CONDUCTORS FOR CIRCUITS THAT ARE ABANDONED. CONFIRM REQUIREMENTS WITH OWNER. FOR COMPLETE DETAILS, REFER TO THE WORK SEQUENCING REQUIREMENTS OF SPECIFICATION SECTION 01 1000.
 4. PROVIDE 36"x36"x12" (MIN) NEMA 12 JUNCTION BOX 'JB-1' WITH THREE 500 KCMIL LUGS PER PHASE AND THREE #2 GROUND LUGS. INTERCEPT AND TERMINATE EXISTING MCC-F FEEDER IN JB-1. PROVIDE NEW FEEDER TO NEW MCC-F AND TEMPORARY FEEDER TO EXISTING MCC-F FROM JB-1 TO KEEP BUILDING IN OPERATION. ONCE NEW MCC-F IS READY FOR SERVICE AND ALL REQUIRED BRANCH CIRCUITS HAVE BEEN CONNECTED TO NEW MCC-F AND SECOND DAF UNIT IS READY FOR DEMOLITION, REMOVE TEMPORARY FEEDER FROM JB-1 TO EXISTING MCC-F, ABANDONED BRANCH CIRCUITS AND CONDUCTORS FROM MCC-F, AND MCC-F AND ASSOCIATED HOUSEKEEPING PAD. COORDINATE DOWN TIME WITH OWNER.
 5. PROVIDE PAINT AROUND WORKING SPACE TO SHOW WORKING CLEARANCE SPACE AS REQUIRED BY NFPA 70E. REFER TO ROOM FINISH SCHEDULE ON P.100.
 6. PROVIDE 5-20R RECEPTACLE FOR POLYMER FEEDER/BLENDER MCP AND INSTALL ABOVE CONCRETE PAD FOR UNIT. VERIFY FINAL MOUNTING HEIGHT AND LOCATION WITH MANUFACTURER PRIOR TO INSTALLATION.
 7. CONNECT CIRCUIT TO SERVICE RECEPTACLE FURNISHED WITH MAU.
 8. HEAT TRACE AND ASSOCIATED CONTROLS PROVIDED BY MECHANICAL CONTRACTOR. CONNECT PER EQUIPMENT MANUFACTURER'S INSTRUCTIONS.



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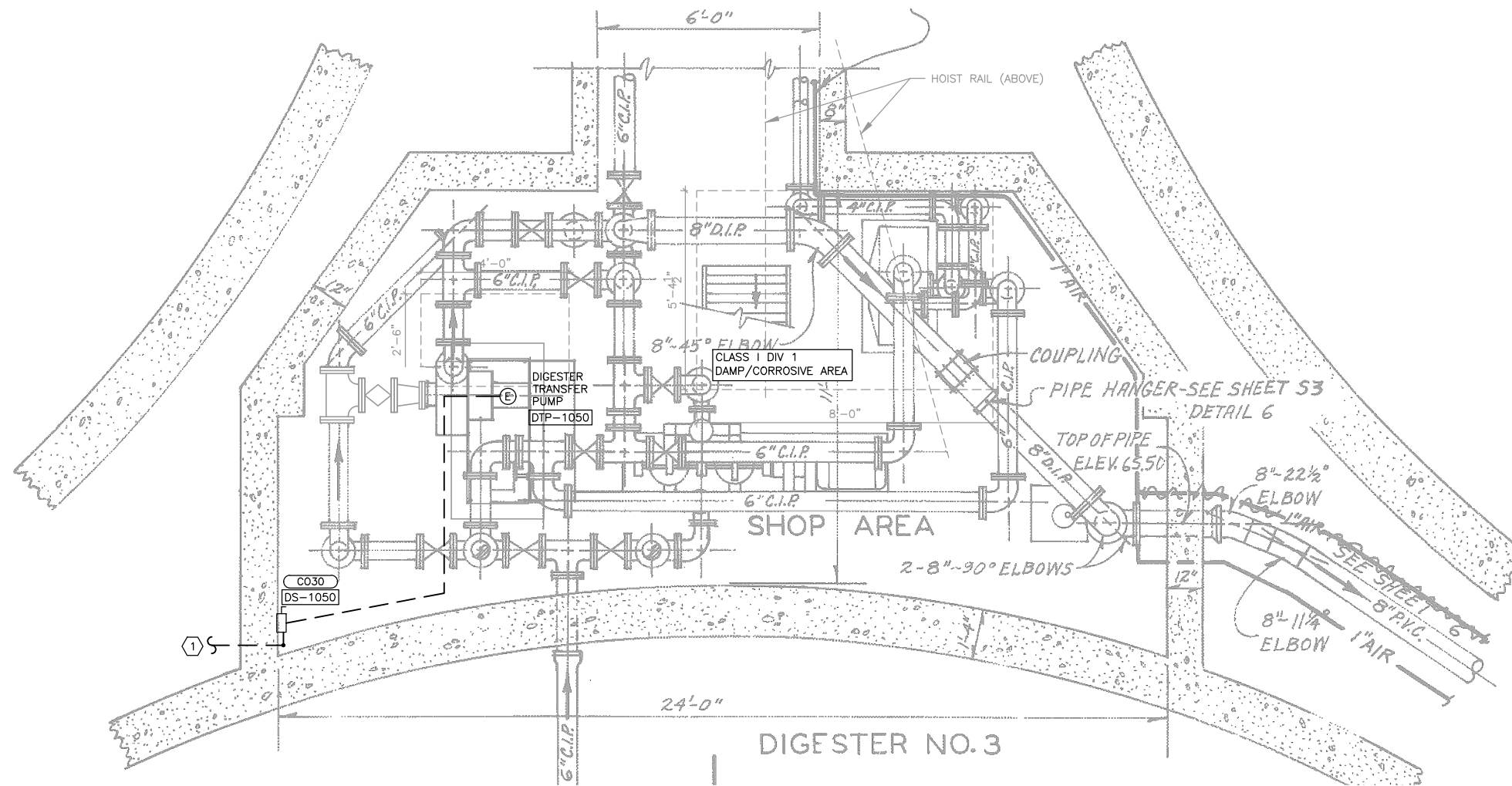
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

ELECTRICAL
RDT BUILDING PLAN

SHEET NO.
E.100



1 DIGESTER CONTROL BUILDING PLAN
SCALE: 1/2" = 1'-0"



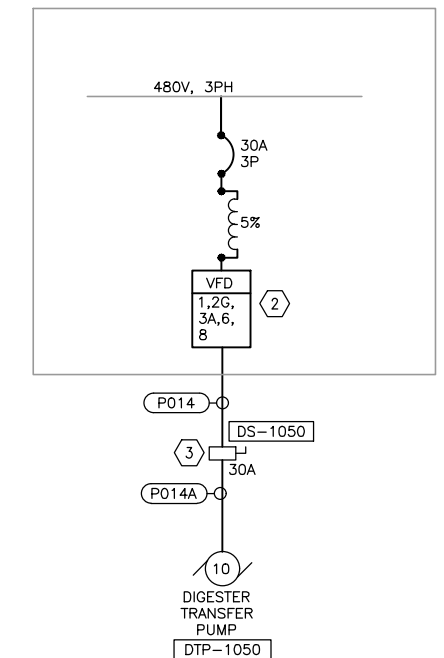
GENERAL NOTES:

1. REFER TO SHEET E.302 FOR LOCATION OF MCC-L AND MORE INFORMATION.
2. BACKGROUND CONTENT ON THIS DRAWING IS ORIGINALLY FROM WPCP BIOSOLIDS IMPROVEMENTS PROJECT, 2002, PROJECT NUMBER 2407-00A. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO BEGINNING WORK.

KEY NOTES: #

1. REFER TO SHEET E.001 FOR CONTINUATION OF CONDUITS AND CONDUCTORS TO BLOWER BUILDING. CONDUITS AND CONDUCTORS SHALL PENETRATE THROUGH DIGESTER BUILDING AS SHOWN AND ROUTE BELOW TO NEW DIGESTER TRANSFER PUMP DISCONNECT. PROVIDE SEAL OFFS AS REQUIRED FOR CONDUITS AND CONDUCTORS WHEN ENTERING CLASSIFIED SPACE AS PER NFPA 70.
2. PROVIDE VARIABLE FREQUENCY DRIVE WITH CIRCUIT BREAKER (MATCH TYPE AND AIC RATING) WITHIN EXISTING MCC-L. VFD SHALL BE HEAVY DUTY, CONSTANT TORQUE RATED.
3. PROVIDE NEMA 7, CLASS 1 DIV.1 RATED, NON-FUSED DISCONNECT. VERIFY FINAL LOCATION WITH ENGINEER PRIOR TO ROUGH-IN. PROVIDE WITH AUXILIARY CONTACTS AND CONNECT TO SHUT DOWN VFD WHEN SWITCH IS OPENED.

EXISTING MCC-L, ALLEN-BRADLEY CENTERLINE, 2100, M-SERIES, MOTOR CONTROL CENTER



1 PARTIAL MCC-L ONE-LINE DIAGRAM
SCALE: NTS

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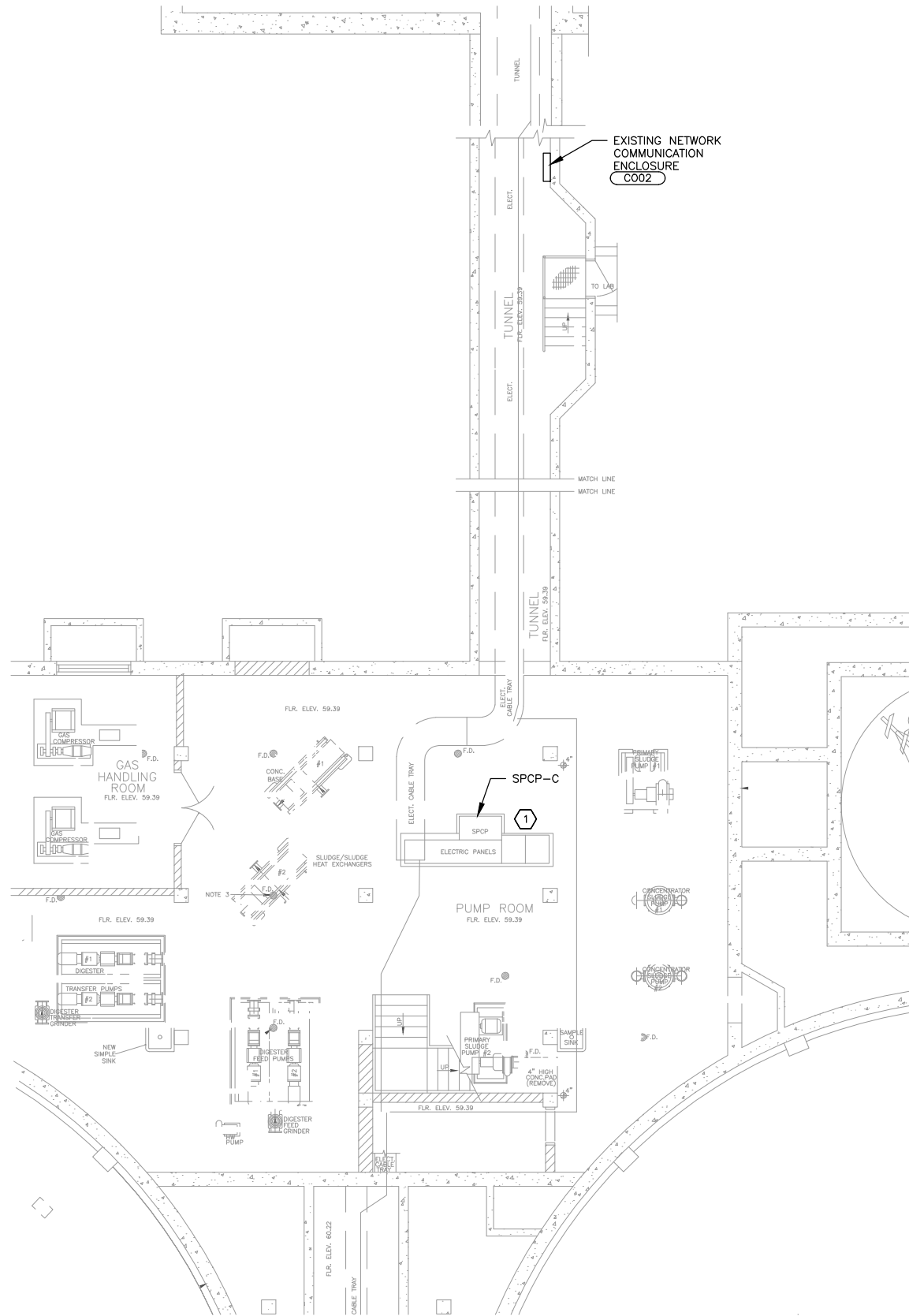
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

ELECTRICAL
DIGESTER CONTROL BUILDING PLAN

SHEET NO.
E.300



GENERAL NOTES:

1. BACKGROUND CONTENT ON THIS DRAWING IS ORIGINALLY FROM WPCP PEAK HOLDING AND PUMPING IMPROVEMENTS PROJECT, 2010, PROJECT NUMBER 2407-09A. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO BEGINNING WORK.

KEY NOTES:

1. DISCONNECT EXISTING DIGESTER TRANSFER PUMP AND REMOVE ALL ASSOCIATED DEVICE AND CONDUIT AND CONDUCTORS BACK TO SOURCE PANEL, MCC-C. LEAVE EXISTING STARTER BUCKET IN MCC-C AS SPARE.

1 DIGESTER TUNNEL PLAN
SCALE: 3/16"=1'-0"



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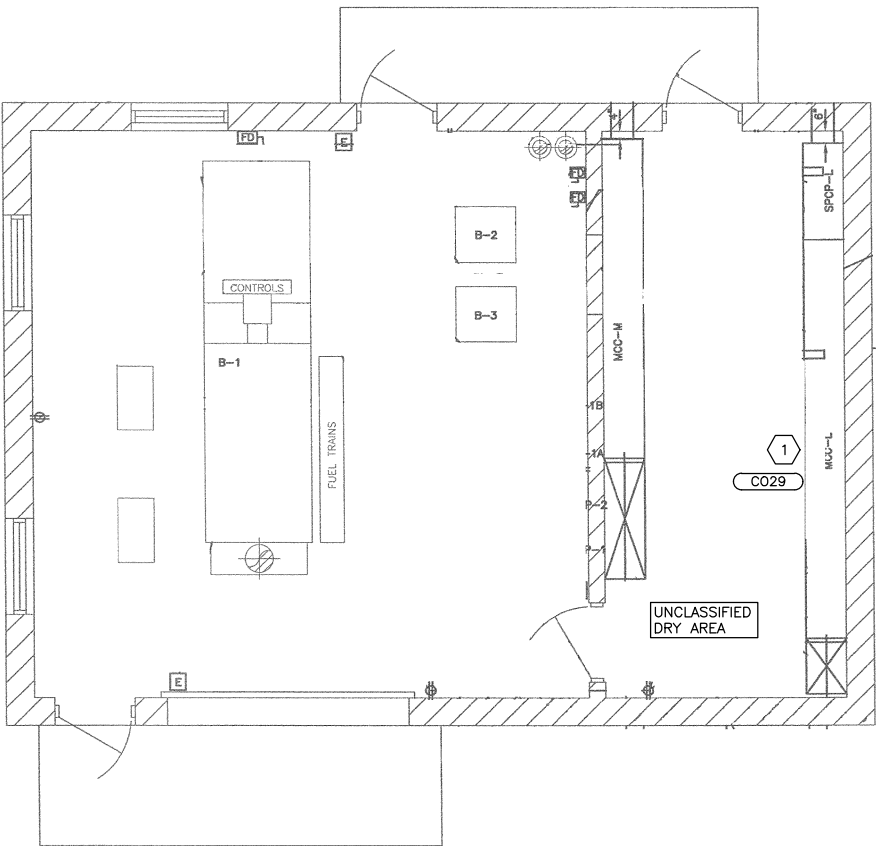
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

ELECTRICAL
DIGESTER TUNNEL PLAN

SHEET NO.
E.301

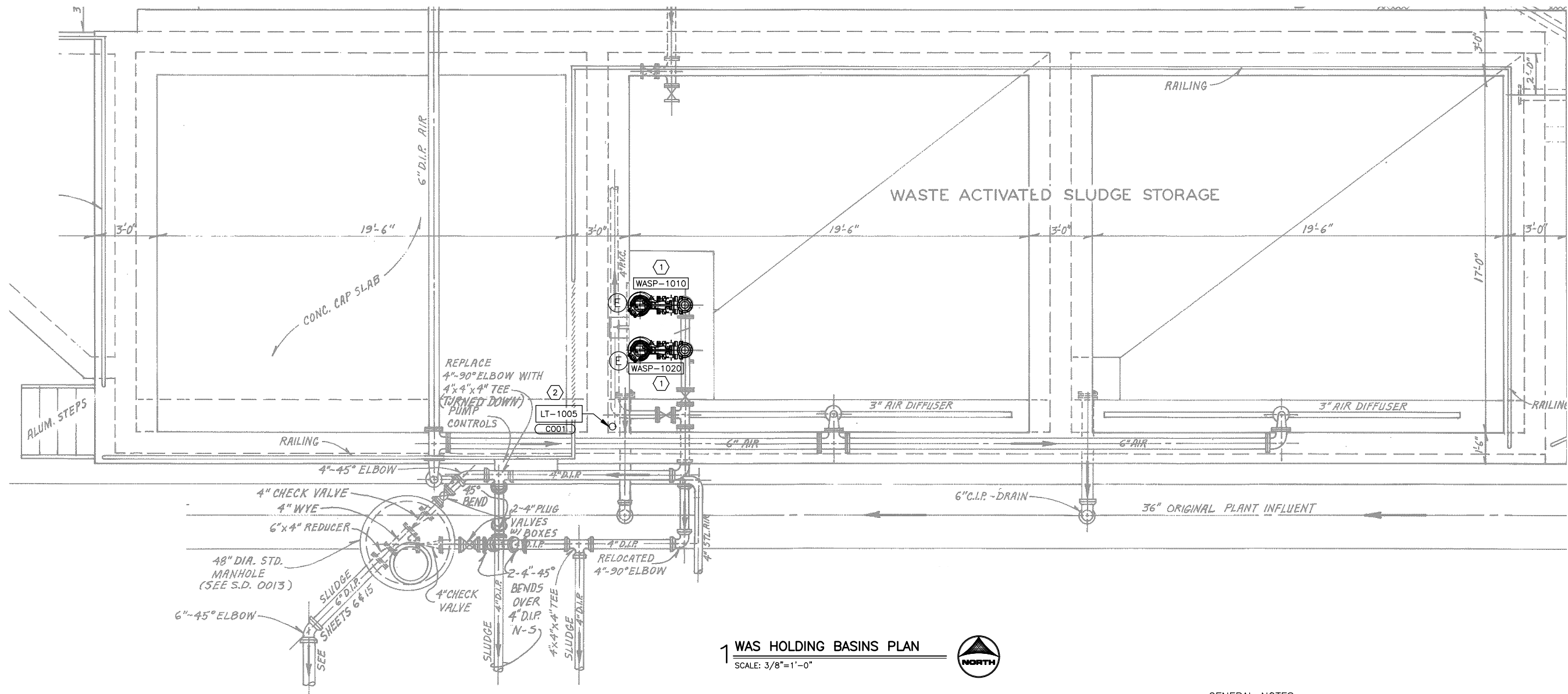


1 BOILER BUILDING PLAN
SCALE: 1/4"=1'-0"



- GENERAL NOTES:
1. REFER TO SHEET E.300 FOR LOCATION AND ONE LINE DIAGRAM FOR DIGESTER TRANSFER PUMP.
 2. BACKGROUND CONTENT ON THIS DRAWING IS ORIGINALLY FROM BIOSOLIDS IMPROVEMENTS PROJECT, 2002, PROJECT NUMBER 2407-00A. INFORMATION SHALL BE VERIFIED BY CONTRACTOR PRIOR TO BEGINNING WORK.
- KEY NOTES: #
1. EXISTING MCC-L LOCATION.
 2. INSTALL DIGESTER TRANSFER PUMP VFD IN SPACE LOCATED IN MCC-L AS SHOWN.

NO.	DATE	BY	REVISION DESCRIPTION



GENERAL NOTES:

1. THE AREA FROM WATER LEVEL TO 18" ABOVE TANK WALLS IS A CLASS 1 DIV 2 LOCATION.

KEY NOTES: (#)

1. REMOVE EXISTING CONDUCTORS FOR REMOVED WAS PUMPS BACK TO SOURCE PANEL. EXTEND EXISTING CONDUIT FOR WAS PUMPS TO NEW MCC-F (SEE E.100). PROVIDE NEW XHHW-2 CONDUCTORS, IN NEW AND EXISTING CONDUITS, FROM WAS PUMP VFD (IN MCC-F) TO WAS PUMP AS SHOWN ON E.500 AND E.600. EXISTING DISCONNECTS FOR THE REPLACED WAS PUMPS SHALL BE REUSED FOR THE NEW PUMPS.
2. REMOVE EXISTING CONDUCTORS BACK TO SPCP-F. INTERCEPT EXISTING CONDUIT INSIDE BUILDING AND EXTEND TO NEW CP-F (SEE E.100). SEE CONTROL CIRCUIT SCHEDULE ON IC.600 FOR CONDUCTORS.

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CAD FILE: J:\2023\2303827\CAD\Dwgs\E\E400 WAS PUMP REPLACE.dwg

BAR IS ONE INCH ON OFFICIAL DRAWINGS.
0 1"
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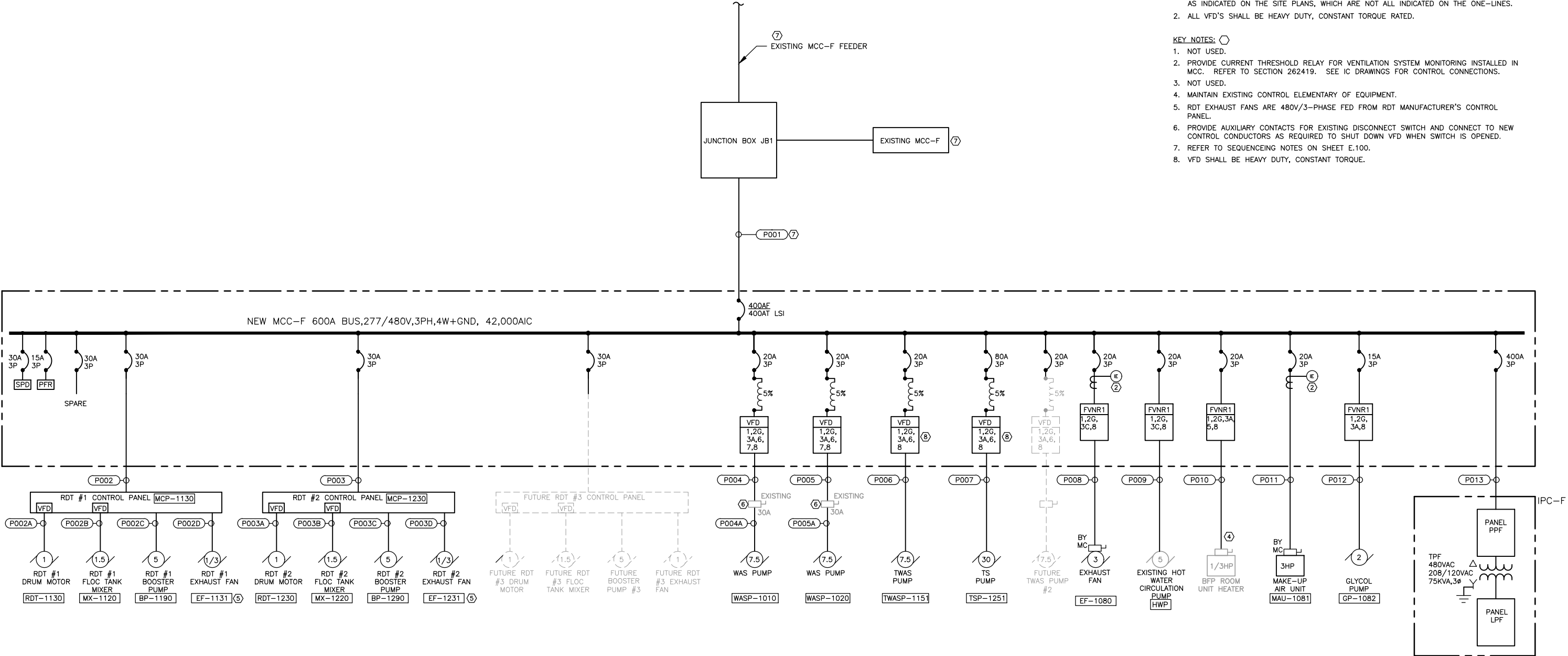


WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

ELECTRICAL
WAS HOLDING BASINS PLAN

SHEET NO.
E.400

- GENERAL NOTES:
1. REFER TO ELECTRICAL SITE PLANS FOR FEEDER ROUTING BETWEEN BUILDINGS AND STRUCTURES. ROUTE FEEDERS VIA VAULT, MANHOLES, AND HANDHOLES IN DUCT BANKS AS INDICATED ON THE SITE PLANS, WHICH ARE NOT ALL INDICATED ON THE ONE-LINES.
 2. ALL VFD'S SHALL BE HEAVY DUTY, CONSTANT TORQUE RATED.
- KEY NOTES:
1. NOT USED.
 2. PROVIDE CURRENT THRESHOLD RELAY FOR VENTILATION SYSTEM MONITORING INSTALLED IN MCC. REFER TO SECTION 262419. SEE IC DRAWINGS FOR CONTROL CONNECTIONS.
 3. NOT USED.
 4. MAINTAIN EXISTING CONTROL ELEMENTARY OF EQUIPMENT.
 5. RDT EXHAUST FANS ARE 480V/3-PHASE FED FROM RDT MANUFACTURER'S CONTROL PANEL.
 6. PROVIDE AUXILIARY CONTACTS FOR EXISTING DISCONNECT SWITCH AND CONNECT TO NEW CONTROL CONDUCTORS AS REQUIRED TO SHUT DOWN VFD WHEN SWITCH IS OPENED.
 7. REFER TO SEQUENCEING NOTES ON SHEET E.100.
 8. VFD SHALL BE HEAVY DUTY, CONSTANT TORQUE.



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CAD FILE: J:\2023\2303827\CAD\Drawings\E500 ONE LINE.dwg

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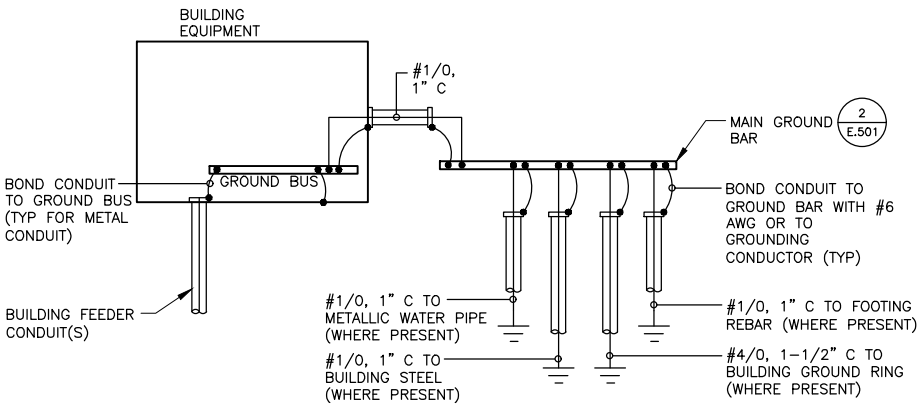


WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

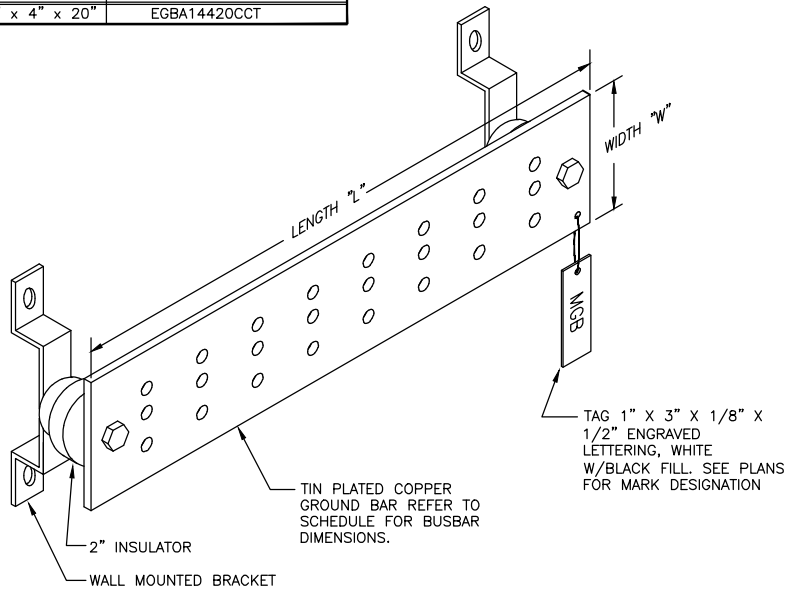
ELECTRICAL
ONE LINE DIAGRAM

SHEET NO.
E.500

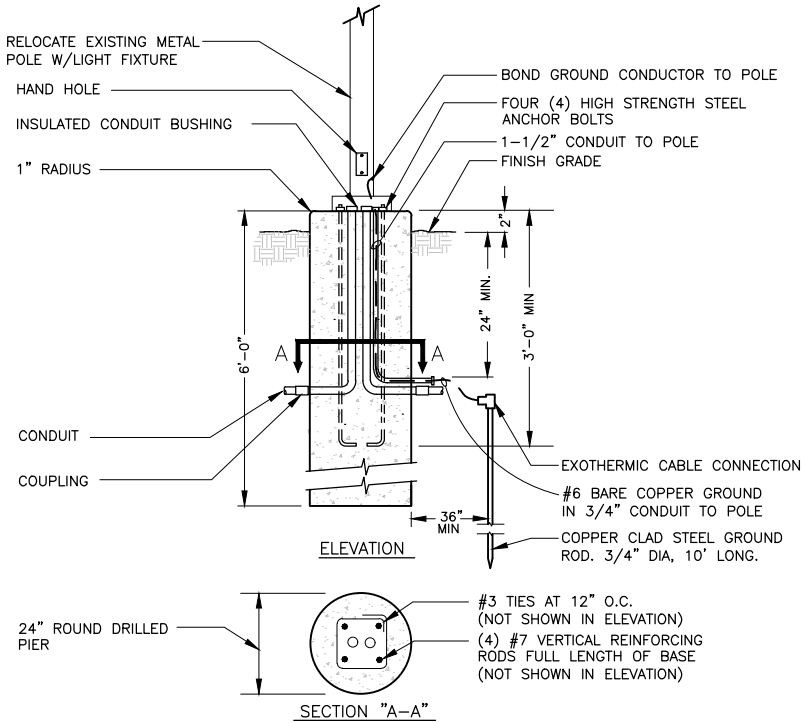
GROUNDING BUSBAR SCHEDULE		
MARK	NOMINAL SIZE	ERICO CAT # OR EQUAL
MGB-1	1/4" x 4" x 20"	EGBA14420CCT



1 THICKENING BUILDING GROUNDING DETAIL
SCALE: NTS

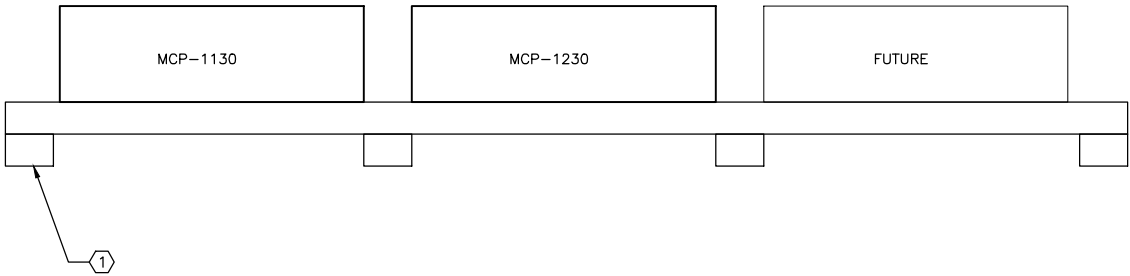


2 GROUNDING BUSBAR DETAIL
SCALE: NTS

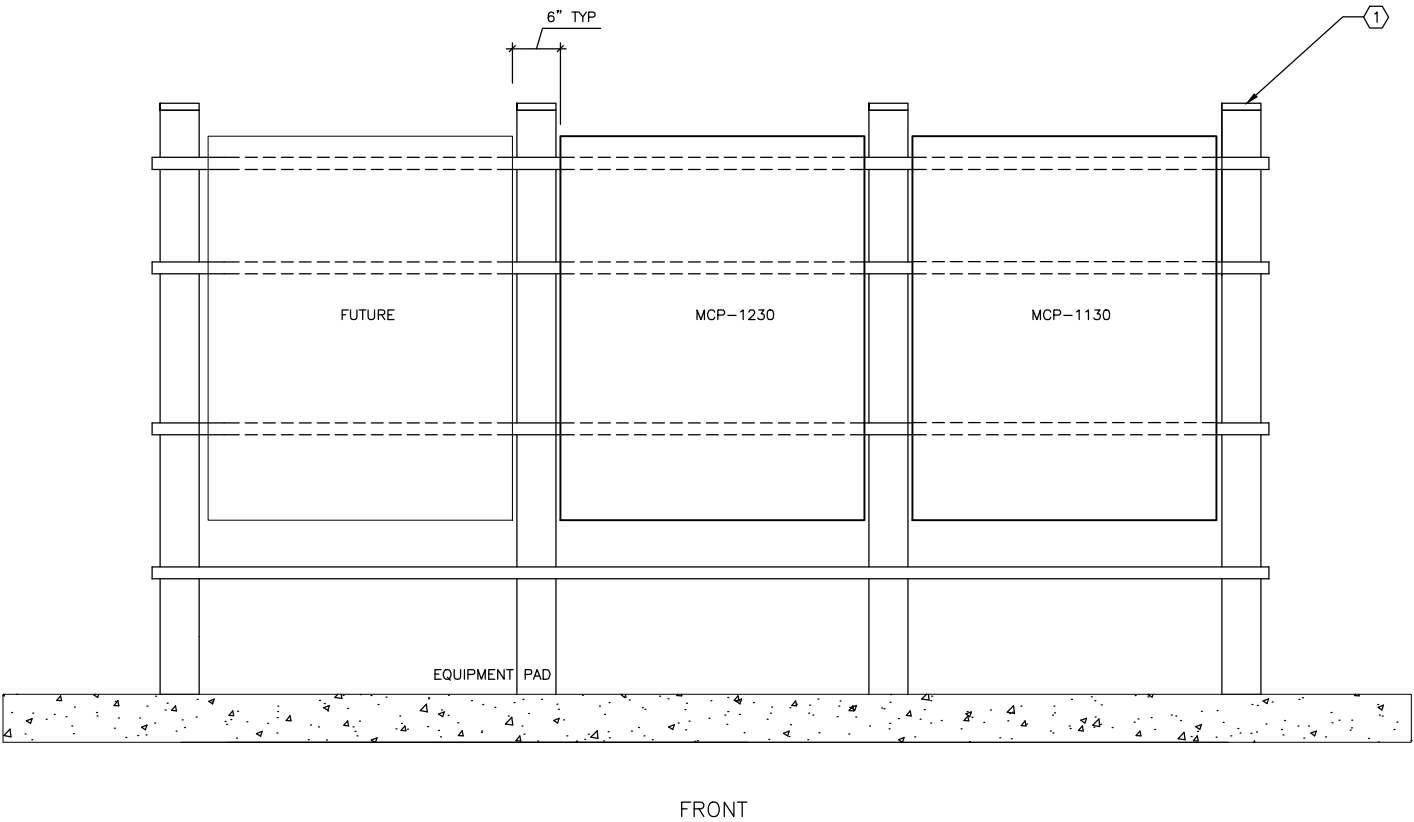


4 LIGHT POLE ON ELEVATED BASE
SCALE: NTS

EQUIPMENT RACK KEY NOTES
1. PROVIDE SS UNISTRUT RACK BOLTED TO HOUSEKEEPING PAD AS REQUIRED.



3 EQUIPMENT RACK DETAIL
SCALE: NTS



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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

ELECTRICAL
ELECTRICAL DETAILS

SHEET NO.
E.501

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2 VFD DETAIL (WASP/DTP PUMPS)

3 VFD DETAIL (TWAS/TSP PUMPS)

1 VFD DETAIL (RDTS/MIXERS)

5 EF-1080 CONTROL ELEMENTARY

EF-1131, EF-1231,
BP-1190 & BP-1290 FVNR STARTER

➤ HWP FVNR STARTER

GP-1082 FVNR STARTER

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refs: xqt-1-dh01; XE-0-D01
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Xrefs: xgt-1-dn01: XE-0-001

CABLE & RACEWAY SCHEDULE							
CIRCUIT #	FROM	TAG #	TO	TAG #	CONDUCTORS	CONDUIT	REMARKS
P001	NEW JUNCTION BOX	JB-1	MOTOR CONTROL CENTER	MCC-F	3-#500 KCMIL, #2 GND	4"	
P002	MOTOR CONTROL CENTER	MCC-F	RDТ #1 MCP	MCP-1130	3-#10, #10 GND	3/4"	
P002A	RDТ#1 MCP	MCP-1130	RDТ #1 DRUM MOTOR	RDТ-1130	3-#12, 2-#14 CTRL, #12 GND	3/4"	#14'S ARE FOR OVERTEMP.
P002B	RDТ#1 MCP	MCP-1130	RDТ #1 FLOC TANK MIXER	MX-1120	3-#12, 2-#14 CTRL, #12 GND	3/4"	#14'S ARE FOR OVERTEMP.
P002C	RDТ#1 MCP	MCP-1130	RDТ #1 BOOSTER PUMP	BP-1190	3-#12, #12 GND	3/4"	
P002D	RDТ#1 MCP	MCP-1130	RDТ #1 EXHAUST FAN	EF-1131	3-#12, #12 GND	3/4"	
P003	MOTOR CONTROL CENTER	MCC-F	RDТ #2 MCP	MCP-1230	3-#10, #10 GND	3/4"	
P003A	RDТ#2 MCP	MCP-1230	RDТ #2 DRUM MOTOR	RDТ-1230	3-#12, 2-#14 CTRL, #12 GND	3/4"	#14'S ARE FOR OVERTEMP.
P003B	RDТ#2 MCP	MCP-1230	RDТ #2 FLOC TANK MIXER	MX-1220	3-#12, 2-#14 CTRL, #12 GND	3/4"	#14'S ARE FOR OVERTEMP.
P003C	RDТ#2 MCP	MCP-1230	RDТ #2 BOOSTER PUMP	BP-1290	3-#12, #12 GND	3/4"	
P003D	RDТ#2 MCP	MCP-1230	RDТ #2 EXHAUST FAN	EF-1231	3-#12, #12 GND	3/4"	
P004	MOTOR CONTROL CENTER	MCC-F	WAS PUMP#1 DISCONNECT	EXISTING	3-#12, 6-#14 CTRL, #12 GND	EXISTING	#14'S ARE FOR SEAL FAIL, OVERTEMP, & DISCONNECT AUX. CONTACT.
P004A	WAS PUMP#1 DISCONNECT	DS-1010	WAS PUMP #1	WASP-1010	MANUFACTURER'S CABLE	-	
P005	MOTOR CONTROL CENTER	MCC-F	WAS PUMP#2 DISCONNECT	EXISTING	3-#12, 6-#14 CTRL, #12 GND	EXISTING	#14'S ARE FOR SEAL FAIL, OVERTEMP, & DISCONNECT AUX. CONTACT.
P005A	WAS PUMP#2 DISCONNECT	DS-1020	WAS PUMP .#2	WASP-1020	MANUFACTURER'S CABLE	-	
P006	MOTOR CONTROL CENTER	MCC-F	TWAS PUMP	TWASP-1151	3-#12, 2-#14 CTRL, #12 GND	3/4"	#14'S ARE FOR OVERTEMP.
P007	MOTOR CONTROL CENTER	MCC-F	TS PUMP	TSP-1251	3-#6, 2-#14 CTRL, #8 GND	1"	#14'S ARE FOR OVERTEMP.
P008	MOTOR CONTROL CENTER	MCC-F	EXHAUST FAN	EF-1080	3-#12, #12 GND	3/4"	
P009	MOTOR CONTROL CENTER	MCC-F	EXISTING HOT WATER CIRCULATION PUMP	HWP	3-#12, #12 GND	3/4"	
P010	MOTOR CONTROL CENTER	MCC-F	EXISTING BFP ROOM UNIT HEATER	EXISTING	3-#12, #12 GND	3/4"	
P011	MOTOR CONTROL CENTER	MCC-F	MAKE UP AIR UNIT	MAU-1081	3-#12, #12 GND	3/4"	
P012	MOTOR CONTROL CENTER	MCC-F	GLYCOL PUMP	GP-1082	3-#12, #12 GND	3/4"	
P013	MOTOR CONTROL CENTER	MCC-F	INTEGRATED POWER CENTER	IPC-F	4-#600 KCMIL, #3 GND	4"	
P014	EXISTING MOTOR CONTROL CENTER	MCC-L	DIGESTER TRANSFER PUMP DISCONNECT	DS-1050	3-#10, #10 GND	1"	
P014A	DIGESTER TRANSFER PUMP DISCONNECT	DS-1050	DIGESTER TRANSFER PUMP	DTP-1050	3-#10, 2-#14 CTRL, #10 GND	3/4"	#14'S ARE FOR OVERTEMP.

PANEL PPF									
SIZE: 400 AMPS			MAINS: 400A MCB			SHORT CIRCUIT RATING: 42,000 AIC SYM			
VOLTS 277/480, 3 PHASE, 4 WIRE			MOUNTING: IPC-F			REMARKS: PANEL IS FURNISHED AS PART OF IPC-F.			
CKT #	DESCRIPTION	LOAD (VA)	BREAKER		BREAKER		LOAD (VA)	DESCRIPTION	CKT #
			TRIP	POLE	POLE	TRIP			
1	RDТ LIGHTS	EXISTING	15	1	1				2
3	RDТ LIGHTS	EXISTING	15	1	1				4
5	SHOP LIGHTS	EXISTING	15	1	1				6
7	RDТ LIGHTS	EXISTING	20	1					8
9	SHOP LIGHTS	EXISTING	20	1					10
11	RDТ CEILING FAN	EXISTING	15	1	3	15	EXISTING	PHASE FAILURE RELAY	12
13	LIGHTING TRANSFORMER	75000	175	3					14
15									16
17									18
19									20
21									22
23									24
25									26
27									28
29									30
31									32
33									34
35	SPARE		15	1					36
37	SPARE		15	1					38
39	SPARE		20	1					40
41	SPARE		20	1					42

PANEL LPF									
SIZE: 225 AMPS			MAINS: 225A MCB			SHORT CIRCUIT RATING: 22,000 AIC SYM			
VOLTS 120/208, 3 PHASE, 4 WIRE			MOUNTING: IPC-F			REMARKS: PANEL IS FURNISHED AS PART OF IPC-F, 100% RATED.			
CKT #	DESCRIPTION	LOAD (VA)	BREAKER		BREAKER		LOAD (VA)	DESCRIPTION	CKT #
			TRIP	POLE	POLE	TRIP			
1	FEEDER/BLENDER #1 MCP-1170	NEW	20	1	1	20	EXISTING	RECEPTACLE CIRCUIT	2
3	FEEDER/BLENDER #2 MCP-1270	NEW	20	1	1	20	EXISTING	RECEPTACLE CIRCUIT/AIR DRYER	4
5	CP-F	NEW	20	1	1	20	EXISTING	RECEPTACLE CIRCUIT	6
7	FIT-1212	NEW	15	1	1	20	EXISTING	RECEPTACLE CIRCUIT	8
9	MAU SERVICE RECEPTACLE	NEW	20	1	2	30	EXISTING	WATER HEATER	10
11	FIT-1259	NEW	15	1					12
13	FIT-1112	NEW	15	1	1	20	EXISTING	SHOP RECEPTACLE	14
15	HEAT TRACE HT-1	NEW	15 30mA GFCI	1	1	20	EXISTING	SHOP DOOR OPENER	16
17					1	20	EXISTING	SHOP RECEPTACLE	18
19					1	20	EXISTING	SHOP EXHAUST FAN	20
21					3	60	EXISTING	NEW SHOP	22
23									24
25									26
27					1	20	NEW	VCP-F	28
29									30
31									32
33									34
35	SPARE		15	1					36
37	SPARE		15	1					38
39	SPARE		20	1					40
41	SPARE		20	1					42

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CAD FILE: J:\2023\2303827\CAD\Dwgs\E\E600 ELEC SCHEDULES.dwg

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WPCP SLUDGE THICKENING IMPROVEMENTS

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

ELECTRICAL

ELECTRICAL SCHEDULES

SHEET NO.

E.600

xe61s xgl-1-dh01: XE-0-001

SIGNAL LIGHTING FIXTURE SCHEDULE						
LEGEND						
G-GRID		P-PLASTER				
S-SURFACE		SP-SUSPENDED				
W-WALL						
TYP E	DESCRIPTION	MANUFACTURER & CATALOG NUMBER	MOUNTIN G	VOLTAG E	REMARKS	ALTERNATE MANUFACTURERS
H2	HORN	EDWARDS SIGNAL 876-N5	W	120	NEMA 4X WALL MOUNTED HORN	
SL2	STROBE	EDWARDS SIGNAL 105XBRMR120A	W	120	EXTERIOR WALL MTD RED MULTI MODE STROBE MTD. AT 8'-0" AFF FOR EXTERIOR LOCATIONS.	
SL3	STROBE	EDWARDS SIGNAL 105XBRMG120A	W	120	EXTERIOR WALL MTD RED MULTI MODE STROBE MTD. AT 8'-0" AFF FOR EXTERIOR LOCATIONS.	

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WPCP SLUDGE THICKENING IMPROVEMENTS

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

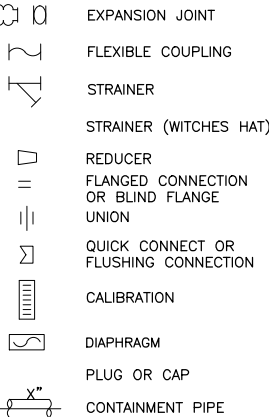
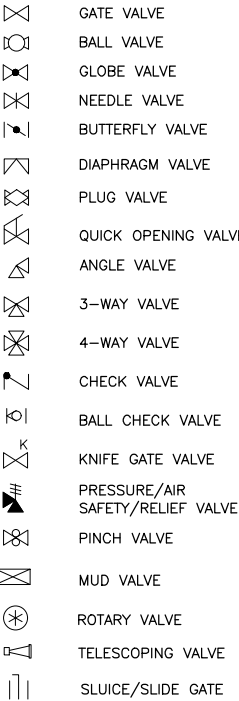
ELECTRICAL

ELECTRICAL SCHEDULES

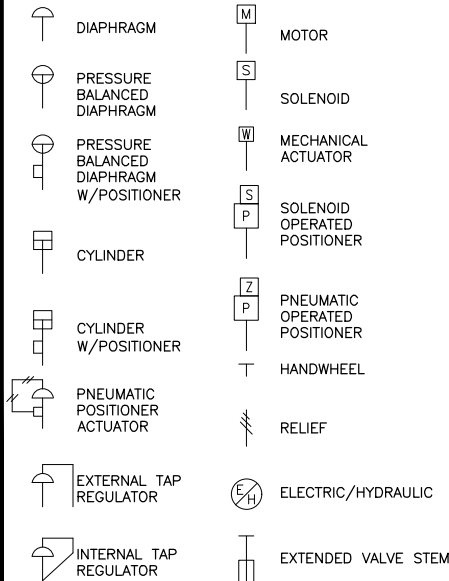
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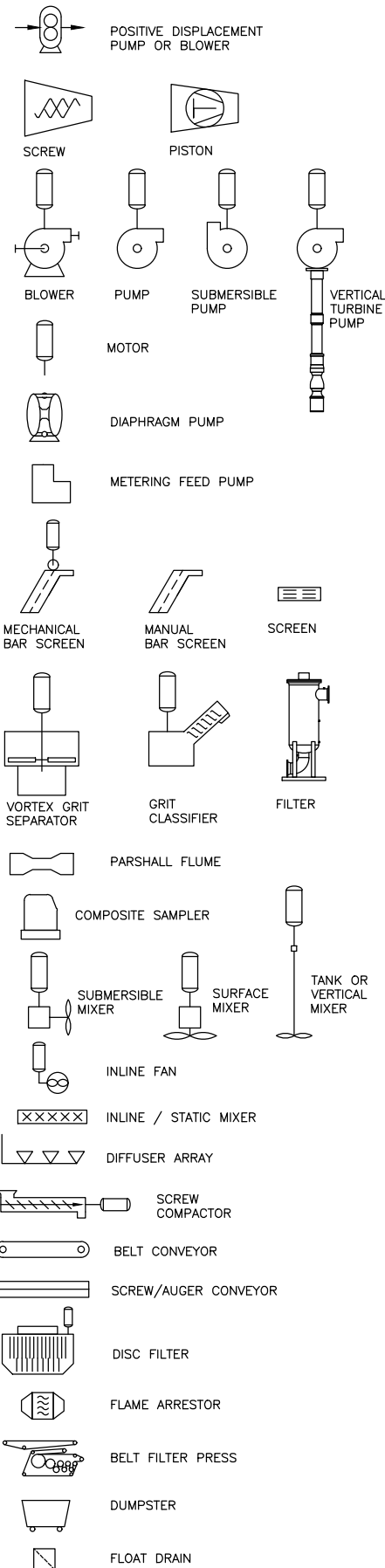
VALVES/PIPE FITTINGS (ONE LINE)



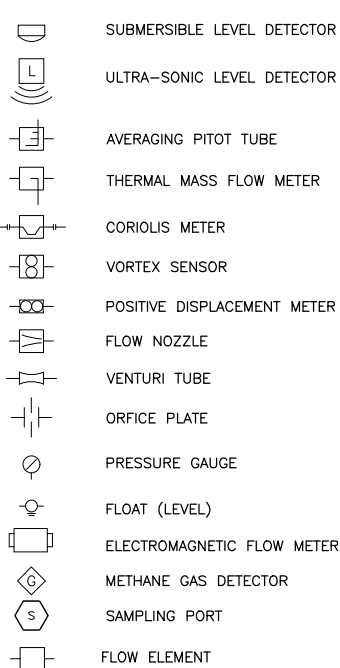
ACTUATOR SYMBOLS



PROCESS EQUIPMENT SYMBOLS



PROCESS INSTRUMENT SYMBOLS



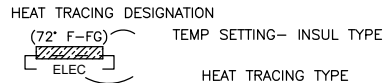
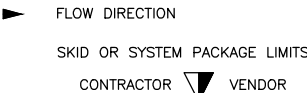
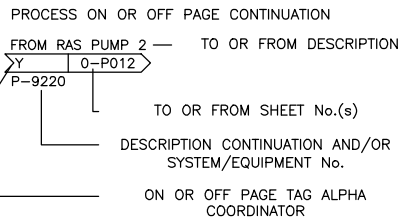
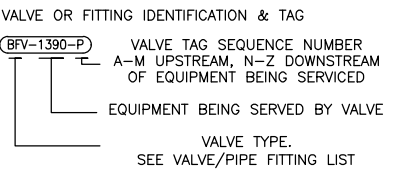
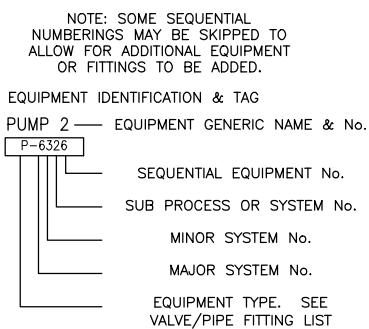
CONTROL CIRCUIT GENERAL NOTES:

- CONTROL CIRCUITS NOT TO BE COMBINED IN THE SAME CONDUIT WITH 480 VAC CIRCUITS.
- 120 VAC CONTROL CIRCUITS NOT TO BE COMBINED WITH 120 VAC POWER CIRCUITS WITHOUT ENGINEER APPROVAL.
- 24 VDC CONTROL CIRCUITS NOT TO BE COMBINED WITH 120 VAC CONTROL OR POWER CIRCUITS.
- ANALOG CONTROL CIRCUITS NOT TO BE COMBINED WITH 24 VDC DISCRETE, 120 VAC CONTROL OR POWER CIRCUITS.
- MANUFACTURER INSTRUMENT CABLES NOT TO BE COMBINED WITH ANY OTHER CABLES OR CIRCUITS.
- COMMUNICATION CABLES NOT TO BE COMBINED WITH NON-COMMUNICATION CIRCUITS UNLESS IDENTIFIED ON THE CIRCUIT SCHEDULE.
- INTRINSICALLY SAFE CIRCUITS NOT TO BE COMBINED WITH ANY NON-INTRINSICALLY SAFE CIRCUITS. INTRINSICALLY SAFE CIRCUITS ALLOWED TO BE COMBINED INTO THE SAME CONDUIT ONLY WHEN THE INTRINSICALLY SAFE BARRIERS ARE PHYSICALLY LOCATED ADJACENT TO EACH OTHER IN THE SAME CONTROL PANEL.
- COMBINING CIRCUITS INTO COMMON HOMERUNS ALLOWED WITH THE RESTRICTIONS LISTED ABOVE AND FOLLOWING NEC CODE.

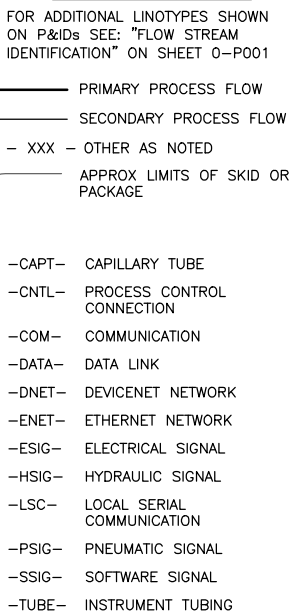
FUNCTIONAL IDENTIFICATION LETTER CODE

FIRST-LETTER			SUCCEEDING-LETTERS		
	MEASURED VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE			CONTROL	CLOSED, CONTROL
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW	RATIO (FRACTION)			FORWARD
G	USER'S CHOICE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		INDICATE
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE/HUMIDITY	MOMENTARY			MIDDLE, INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	OPERATING, ON		ORIFICE, RESTRICTION		OPENED, ON
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		REVERSE
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECH ANALYSIS			VALVE DAMPER, LOUVER	
W	WEIGHT FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED	
				FINAL CNTRL ELEMENT	

MISCELLANEOUS SYMBOLS

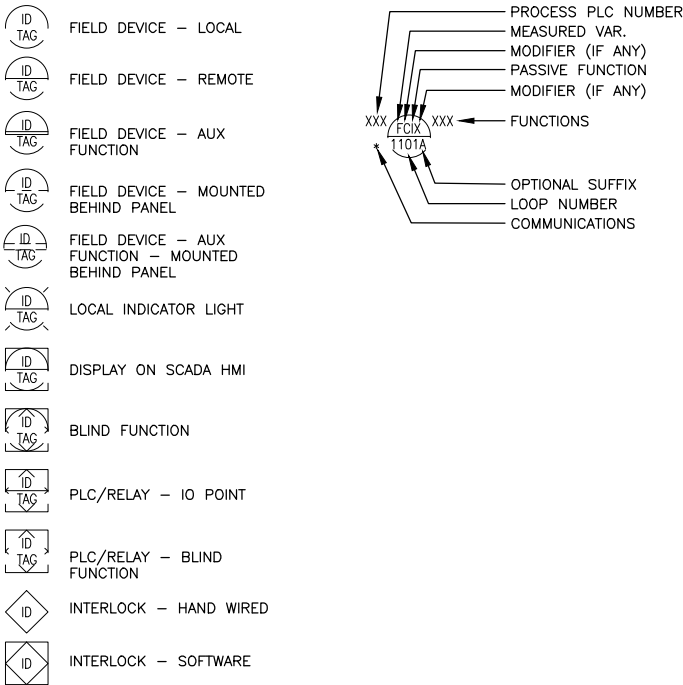


P&ID LINE LEGEND



FUNCTION IDENTIFICATION

(ALSO SEE FUNCTIONAL IDENTIFICATION CODE CHART)



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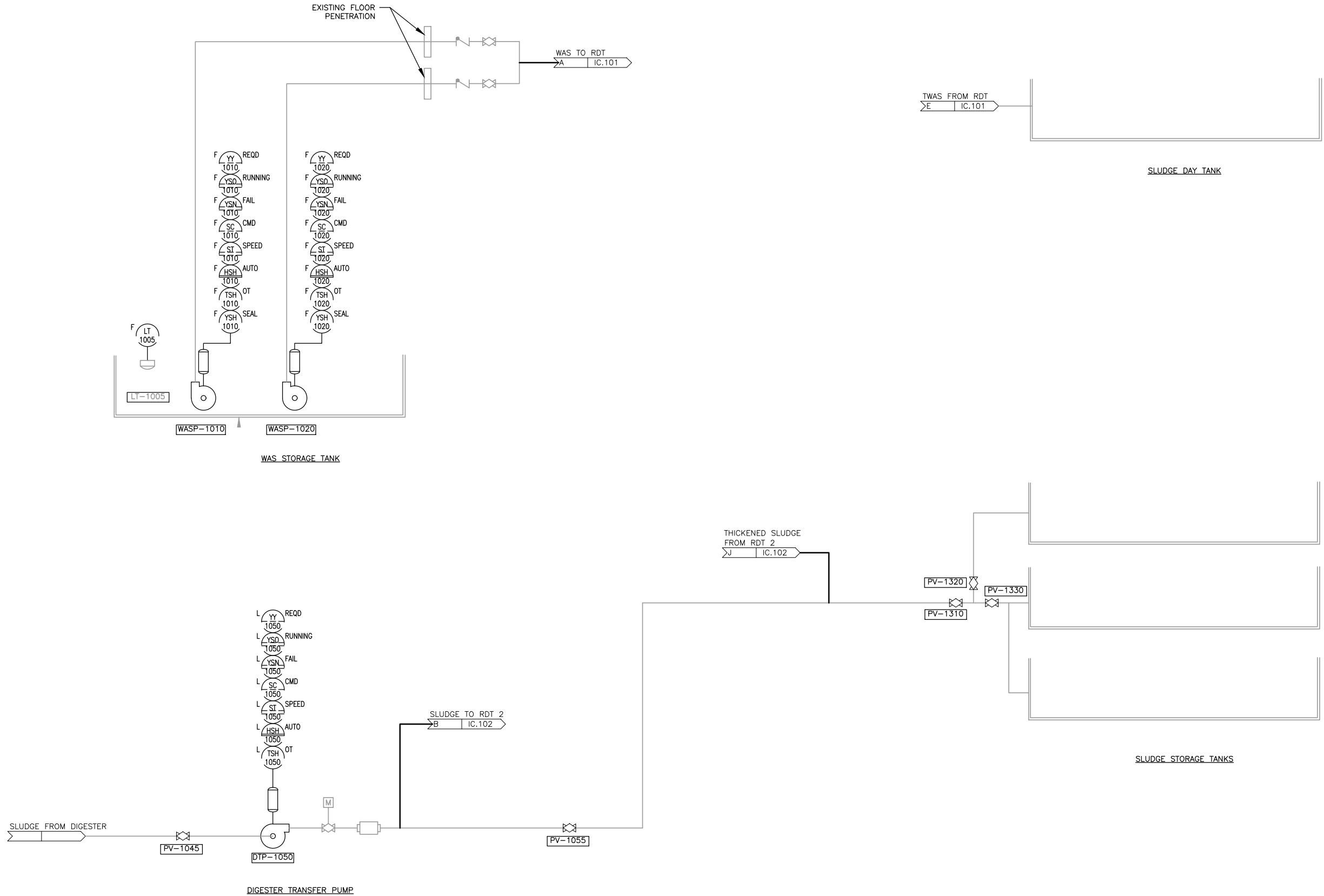
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

INSTRUMENTATION & CONTROL
I&C LEGEND & ABBREVIATIONS

SHEET NO.
IC.000



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APPROVED: DJO JOB NUMBER: 2303827
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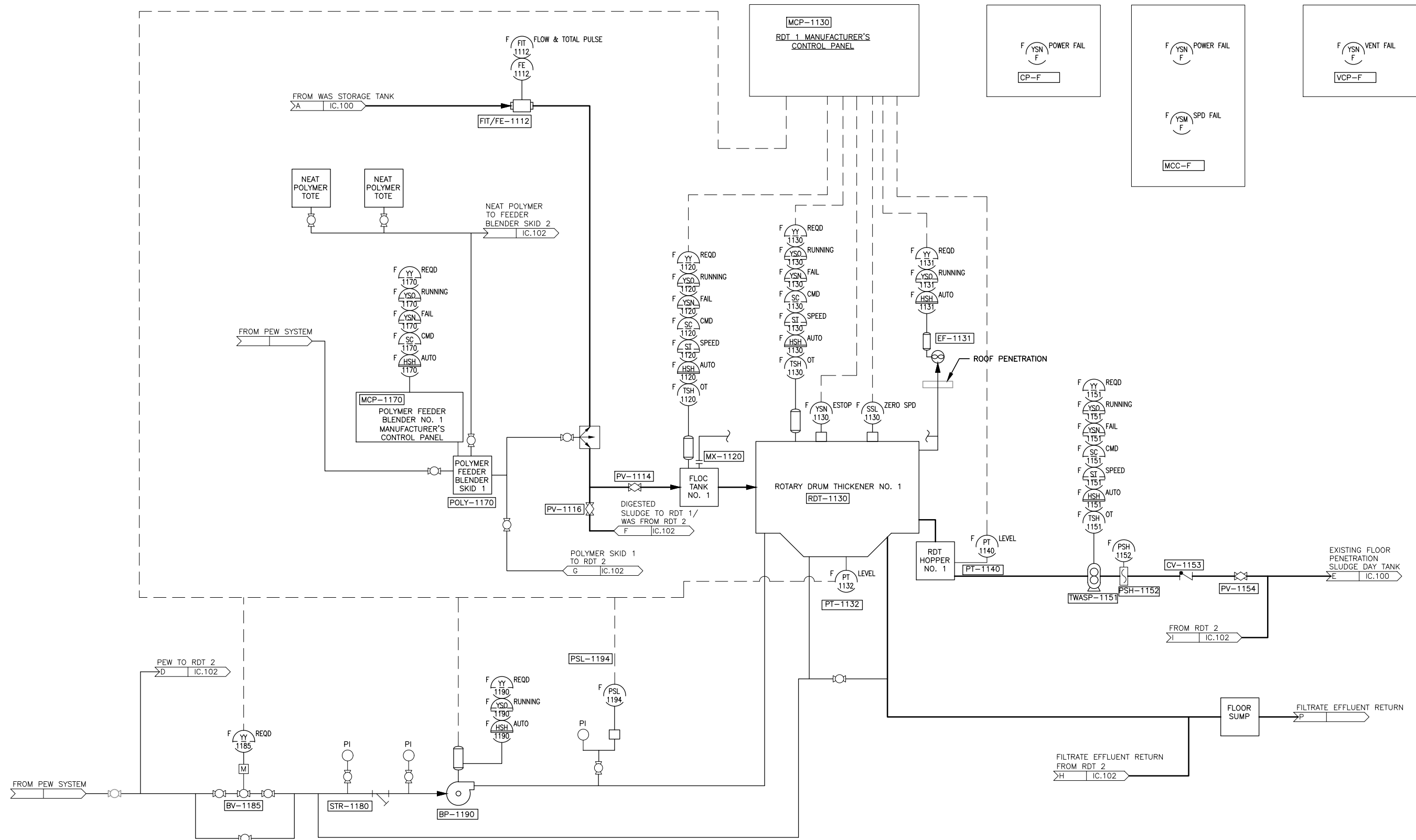
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

INSTRUMENTATION & CONTROL
EXISTING DIGESTER & WAS STORAGE P&ID

SHEET NO.
IC.100



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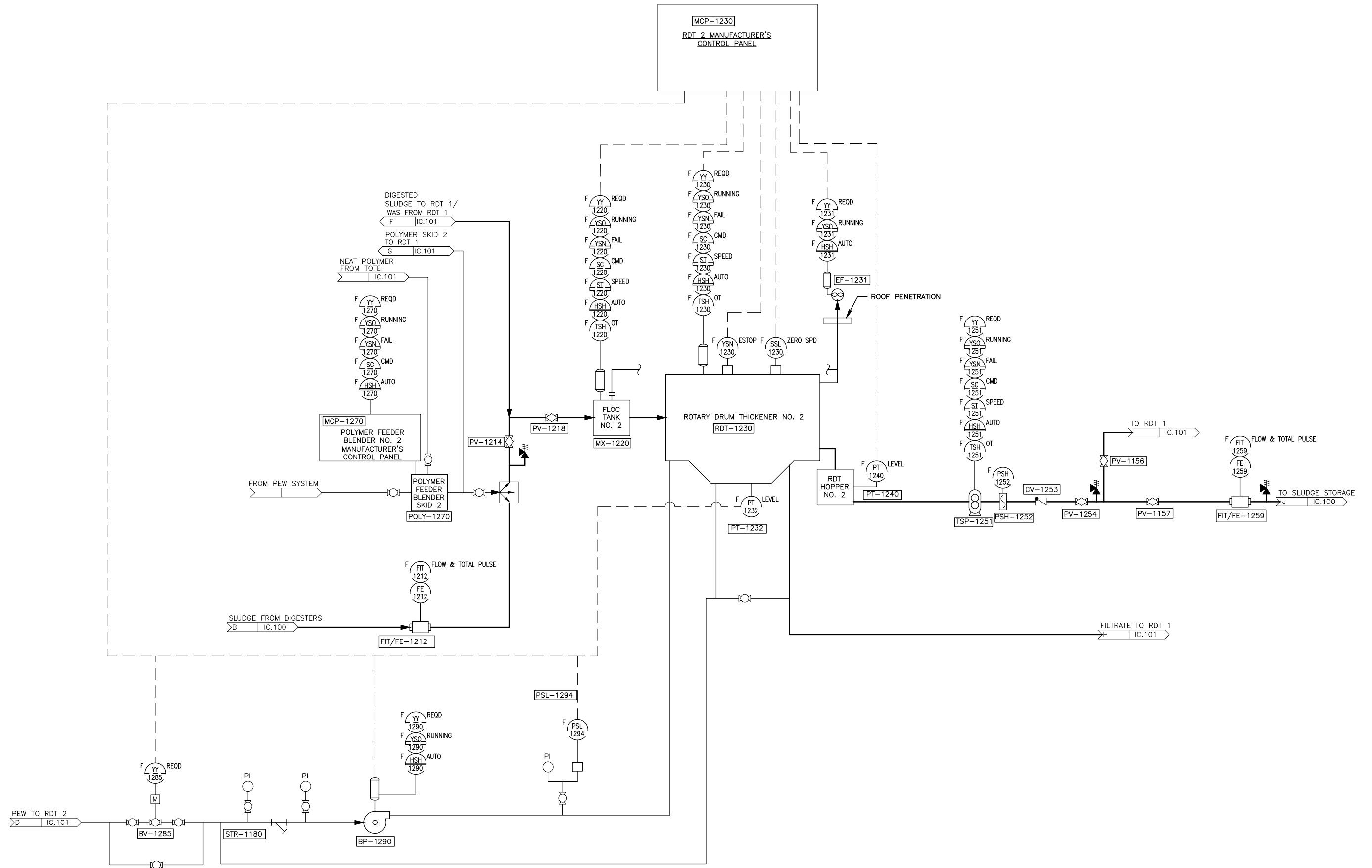
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

INSTRUMENTATION & CONTROL
RDT 1 P&ID

SHEET NO.
IC.101



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 APPROVED: DJO JOB NUMBER: 2303827
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 OFFICIAL DRAWINGS.
 IF NOT ONE INCH,
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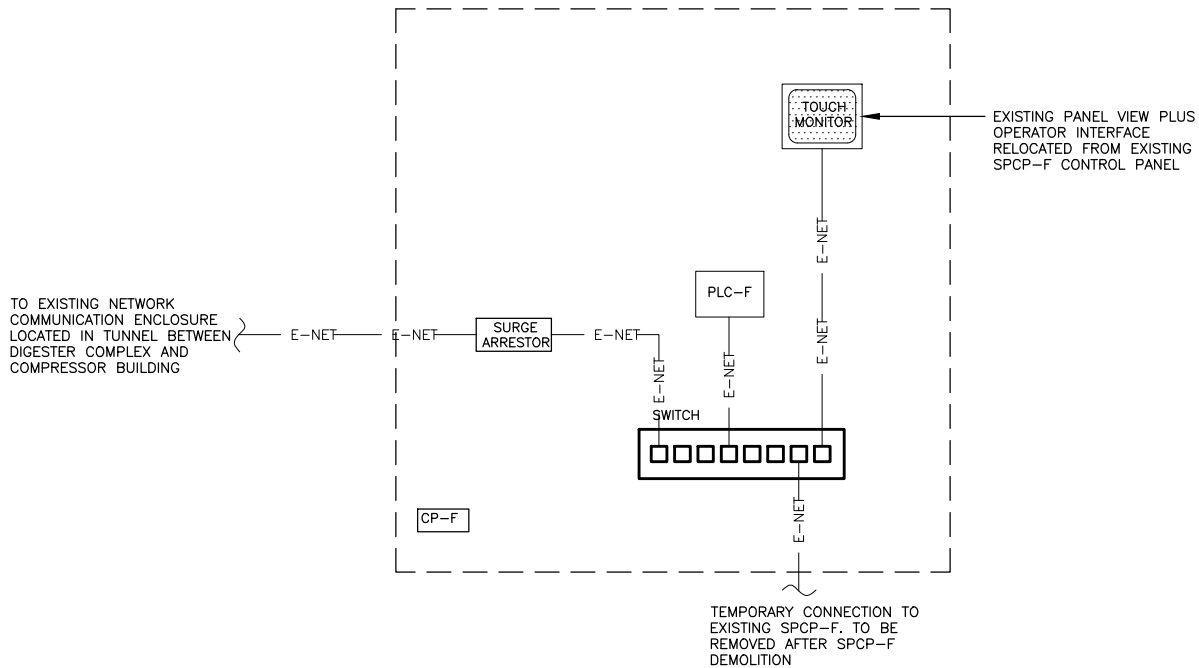


WPCP SLUDGE THICKENING IMPROVEMENTS
 CITY OF MARSHALLTOWN
 MARSHALLTOWN, IOWA

INSTRUMENTATION & CONTROL
 RDT 2 P&ID

SHEET NO.
 IC.102

Xrefs: xgl-1-dn01: XIC-1-NWK



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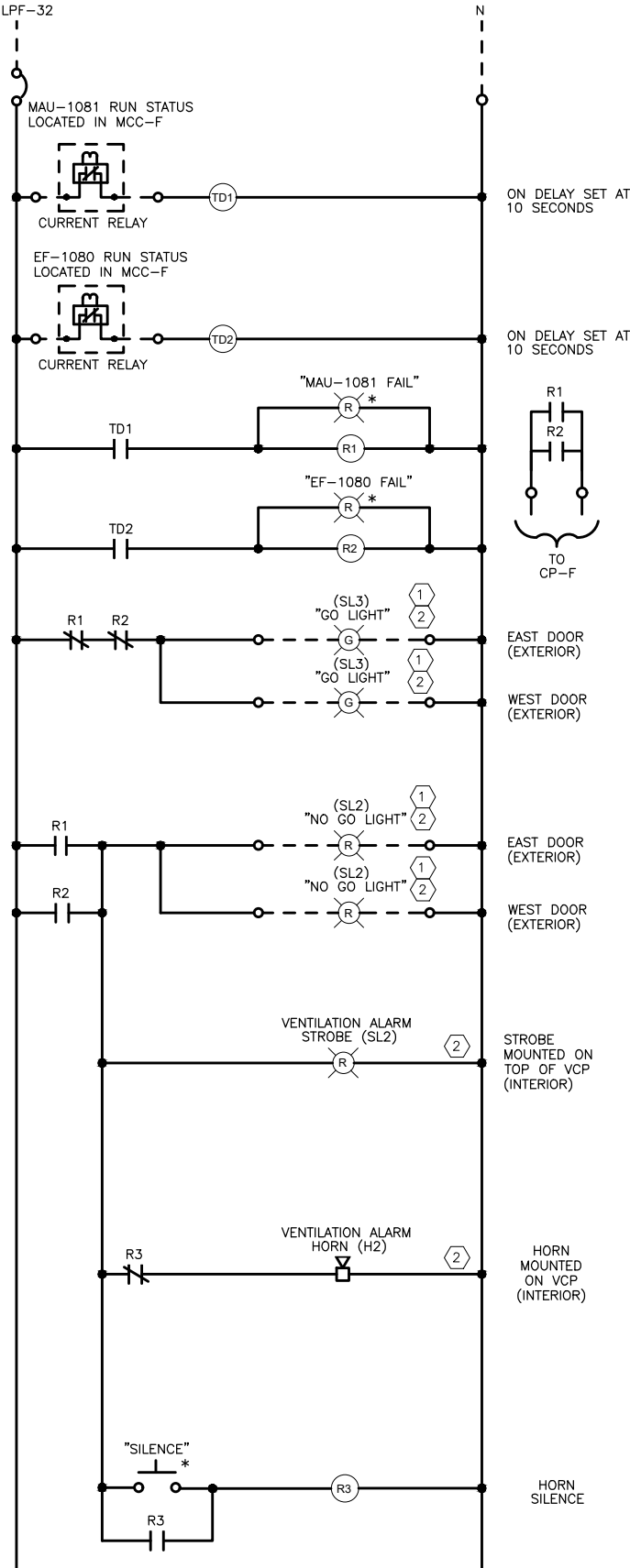
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WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

INSTRUMENTATION & CONTROL
NETWORK DIAGRAM

SHEET NO.
IC.500



- GENERAL NOTES:
- 1 "*" ASTERISK REFERS TO COMPONETS MOUNTED ON VENTILATION CONTROL PANEL FRONT.
 - 2 ALL PILOT LIGHTS ARE PUSH-TO-TEST. PUSH-TO-TEST NOT SHOWN.
- KEY NOTES:
- 1 REFER TO ELECTRICAL LIGHTING PLANS FOR PHYSICAL LOCATIONS OF LIGHTS AND ALARM HORNS.
 - 2 REFER TO LIGHTING SCHEDULE ON SHEET E.601 FOR KEY #'S, DESCRIPTIONS AND MANUFACTURERS.

1 VCP-F DETAIL

NO.	DATE	BY	REVISION DESCRIPTION



WPCP SLUDGE THICKENING IMPROVEMENTS
CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA

INSTRUMENTATION & CONTROL
VENTILATION CONTROL DIAGRAM

CONTROL CABLE & RACEWAY SCHEDULE							
CIRCUIT #	FROM	TAG #	TO	TAG #	CONDUCTORS	CONDUIT	REMARKS
C001	EXISTING WAS STORAGE TANK SUBMERSIBLE LEVEL TRANSMITTER	LT-1005	SLUDGE THICKENING CONTROL PANEL	CP-F	1-#18 TSP, #14 GND	3/4"	INTRINSICALLY SAFE CIRCUIT. INTERCEPT EXISTING CONDUIT WHERE IS LEAVES BUILDING. REMOVE EXISTING CONDUCTORS AND REPLACE.
C002	EXISTING NETWORK COMMUNICATION ENCLOSURE LOCATED IN TUNNEL	-	SLUDGE THICKENING CONTROL PANEL	CP-F	1-CAT6 TYPE DSC1, #14 GND	3/4"	INTERCEPT EXISTING CONDUIT WHERE IS LEAVES BUILDING. REMOVE EXISTING CONDUCTORS AND REPLACE.
C003	EXISTING SUPERVISORY PROCESS CONTROL PANEL	SPCP-F	SLUDGE THICKENING CONTROL PANEL	CP-F	1-CAT6 TYPE DSC1	-	TEMPORARY COMMUNICATION CABLE NOT IN CONDUIT. SUPPORT FROM EXISTING STRUCTURE.
C004	SLUDGE THICKENING MOTOR CONTROL CENTER	MCC-F	SLUDGE THICKENING CONTROL PANEL	CP-F	52-#14, #14 GND	3"	WASP-1010, WASP-1020, TWASP-1151, AND TSP-1251 DISCRETE CONTROL SIGNALS. MCC POWER AND SPD FAIL. 10-SPARE.
C005	SLUDGE THICKENING MOTOR CONTROL CENTER	MCC-F	SLUDGE THICKENING CONTROL PANEL	CP-F	12-#18 TSP, #14 GND	3"	WASP-1010, WASP-1020, TWASP-1151, AND TSP-1251 ANALOG CONTROL SIGNALS. 4-SPARE.
C006	WAS FLOW TRANSMITTER	FIT-1112	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#18 TSP, #14 GND	3/4"	FLOW & DC FLOW TOTALIZER PULSE.
C007	WAS FLOW ELEMENT	FE-1112	WAS FLOW TRANSMITTER	FIT-1112	MANUFACTURER'S CABLE, #14 GND	3/4"	
C008	POLYMER FEEDER BLENDER NO. 1 MANUFACTURER'S CONTROL PANEL	MCP-1170	SLUDGE THICKENING CONTROL PANEL	CP-F	6-#14, #14 GND	3/4"	DISCRETE CONTROL SIGNALS. 2-SPARE.
C009	POLYMER FEEDER BLENDER NO. 1 MANUFACTURER'S CONTROL PANEL	MCP-1170	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#18 TSP, #14 GND	3/4"	ANALOG CONTROL SIGNAL. 1-SPARE.
C010	RDT NO. 1 MACHINE MOUNTED LOW VOLTAGE JUNCTION BOX	RDT-1130	RDT NO.1 MANUFACTURER'S CONTROL PANEL	MCP-1130	15-#14, #14 GND	1"	DISCRETE CONTROL SIGNALS. 3-SPARE.
C011	RDT NO. 1 MACHINE MOUNTED LOW VOLTAGE JUNCTION BOX	RDT-1130	RDT NO.1 MANUFACTURER'S CONTROL PANEL	MCP-1130	3-#18 TSP, #14 GND	3/4"	ANALOG CONTROL SIGNALS. 1-SPARE.
C012	RDT NO.1 MANUFACTURER'S CONTROL PANEL	MCP-1130	SLUDGE THICKENING CONTROL PANEL	CP-F	38-#14, #14 GND	2"	DISCRETE CONTROL SIGNALS. 6-SPARE.
C013	RDT NO.1 MANUFACTURER'S CONTROL PANEL	MCP-1130	SLUDGE THICKENING CONTROL PANEL	CP-F	7-#18 TSP, #14 GND	1.5"	ANALOG CONTROL SIGNALS. 1-SPARE.
C014	TWASP-1151 DISCHARGE PRESSURE SWITCH	PSH-1152	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#14, #14 GND	3/4"	
C015	DIGESTED SLUDGE FLOW TRANSMITTER	FIT-1212	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#18 TSP, #14 GND	3/4"	FLOW & DC FLOW TOTALIZER PULSE.
C016	DIGESTED SLUDGE FLOW ELEMENT	FE-1212	DIGESTED SLUDGE FLOW TRANSMITTER	FIT-1212	MANUFACTURER'S CABLE, #14 GND	3/4"	
C017	POLYMER FEEDER BLENDER NO. 2 MANUFACTURER'S CONTROL PANEL	MCP-1270	SLUDGE THICKENING CONTROL PANEL	CP-F	6-#14, #14 GND	3/4"	DISCRETE CONTROL SIGNALS. 2-SPARE.
C018	POLYMER FEEDER BLENDER NO. 2 MANUFACTURER'S CONTROL PANEL	MCP-1270	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#18 TSP, #14 GND	3/4"	ANALOG CONTROL SIGNAL. 1-SPARE.
C019	RDT NO. 2 MACHINE MOUNTED LOW VOLTAGE JUNCTION BOX	RDT-1230	RDT NO.2 MANUFACTURER'S CONTROL PANEL	MCP-1230	15-#14, #14 GND	1"	DISCRETE CONTROL SIGNALS. 3-SPARE.
C020	RDT NO. 2 MACHINE MOUNTED LOW VOLTAGE JUNCTION BOX	RDT-1230	RDT NO.2 MANUFACTURER'S CONTROL PANEL	MCP-1230	3-#18 TSP, #14 GND	3/4"	ANALOG CONTROL SIGNALS. 1-SPARE.
C021	RDT NO.2 MANUFACTURER'S CONTROL PANEL	MCP-1230	SLUDGE THICKENING CONTROL PANEL	CP-F	38-#14, #14 GND	2"	DISCRETE CONTROL SIGNALS. 6-SPARE.
C022	RDT NO.2 MANUFACTURER'S CONTROL PANEL	MCP-1230	SLUDGE THICKENING CONTROL PANEL	CP-F	7-#18 TSP, #14 GND	1.5"	ANALOG CONTROL SIGNALS. 1-SPARE.
C023	TSP-1251 DISCHARGE PRESSURE SWITCH	PSH-1252	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#14, #14 GND	3/4"	
C024	THICKENED DIGESTED SLUDGE FLOW TRANSMITTER	FIT-1259	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#18 TSP, #14 GND	3/4"	FLOW & DC FLOW TOTALIZER PULSE.
C025	THICKENED DIGESTED SLUDGE FLOW ELEMENT	FE-1259	THICKENED DIGESTED SLUDGE FLOW TRANSMITTER	FIT-1259	MANUFACTURER'S CABLE, #14 GND	3/4"	
C026	VENTILATION CONTROL PANEL	VCP-F	SLUDGE THICKENING CONTROL PANEL	CP-F	2-#14, #14 GND	3/4"	VENTILATION FAILURE SIGNAL.
C027	EAST DOOR EXTERIOR GO/NO GO LIGHTS	-	SLUDGE THICKENING CONTROL PANEL	CP-F	4-#14, #14 GND	3/4"	
C028	WEST DOOR EXTERIOR GO/NO GO LIGHTS	-	SLUDGE THICKENING CONTROL PANEL	CP-F	4-#14, #14 GND	3/4"	
C029	EXISTING BOILER BUILDING MCC	MCC-L	EXISTING BOILER BUILDING SUPERVISORY PROCESS CONTROL PANEL	SPCP-L	7-#14, 2-#18 TSP	-	DTP-1050 DISCRETE AND ANALOG CONTROL SIGNALS. INSTALL IN EXISTING DIVIDED WIREWAY FROM MCC TO CONTROL PANEL.
C030	DIGESTER TRANSFER PUMP OVERTEMP. DISC. AUX SIGNALS	DS-1050	EXISTING BOILER BUILDING MCC	MCC-L	4-#14, #14 GND	1"	
C031	NOT USED						
C032	NOT USED						
C033	NOT USED						
C034	NOT USED						
C035	NOT USED						

NO.	DATE	BY	REVISION DESCRIPTION



Specification No. _____

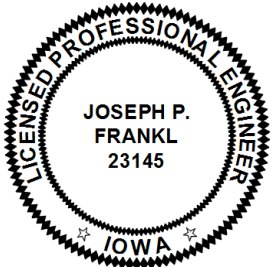
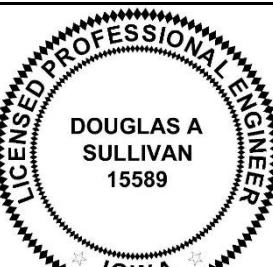
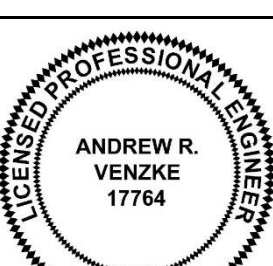
**PROJECT MANUAL
FOR
WPCP Sludge Thickening Improvements
Project Number WPC 24-001
Marshalltown, Iowa
2024**

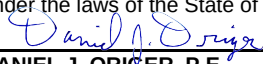
OWNERSHIP OF DOCUMENT

This document, and the ideas and designs incorporated herein, as an instrument of professional service, is the property of HR Green, Inc. and is not to be used, in whole or in part, for any other project without the written authorization of HR Green, Inc.

CERTIFICATION

PROJECT MANUAL
WPCP Sludge Thickening Improvements
City of Marshalltown
2024

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Joseph P. Frankl</u> Date: <u>2/5/2025</u> JOSEPH P. FRANKL, P.E. License No. 23145 My renewal date is December 31, 2026. Pages or sheets covered by this seal: Division 1, 2, 9, 22 (except 22 0500, 22 0533, 22 0553, 22 0719, 22 1005, 22 1006, 22 4000), 31, 32, 33, 43, and 46
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Dennis L. Neumann</u> Date: <u>2/5/2025</u> DENNIS L. NEUMANN, P.E. License No. 18269 My renewal date is December 31, 2026. Pages or sheets covered by this seal: Divisions 3, 5, 6, and 7
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Douglas A. Sullivan</u> Date: <u>2/5/2025</u> DOUGLAS A SULLIVAN, P.E. License No. 15589 My renewal date is December 31, 2026. Pages or sheets covered by this seal: Division 23, and 22 0500, 22 0533, 22 0553, 22 0719, 22 1005, 22 1006, and 22 4000
	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. <u>Andrew R. Venzke</u> Date: <u>2/5/2025</u> ANDREW R. VENZKE, P.E. License No. 17764 My renewal date is December 31, 2025. Pages or sheets covered by this seal: Division 26

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.
	 _____ DANIEL J. ORIGER, P.E.
	Date: <u>2/5/2025</u>
	License No. P26358
	My renewal date is December 31, 2025
	Pages or sheets covered by this seal: <u>Division 25</u> _____

HR Green, Inc.
5525 Merle Hay Road, Suite 200
Johnston, IA 50131
Phone: 515-278-2913
Fax: 515-278-1846

PROJECT MANUAL
WPCP Sludge Thickening Improvements
City of Marshalltown

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**SECTION 00110
NOTICE TO BIDDERS**

FILING OF SEALED BIDS

Sealed Bids will be received by the City Clerk of the City of Marshalltown ("Owner"), at City of Marshalltown, 24 N. Center St., Marshalltown, IA 50158 until 11:00 AM, on March 4, 2025, for the construction of the proposed WPCP Sludge Thickening Improvements for said Owner, as described in the Specifications and drawings therefore on file in the office of the City Clerk of the City of Marshalltown. Bids will be publicly opened, read, and tabulated on the day and hour specified above, and will be acted upon by the Owner at that time or at such later time and place as the Owner may then determine.

GENERAL PROJECT DESCRIPTION

All Work, materials, and equipment are to be in accordance with the Contract Documents on file in the office of the City Clerk, and at the office of HR Green, Des Moines ("Engineer"), 5525 Merle Hay Road Suite 200, Johnston, IA 50131, by this reference made a part hereof as though fully set out and incorporated herein.

The Work for the said improvement, as required by the Contract Documents, is generally described as follows:

The DAF Building at Marshalltown's Water Pollution Control Plant (WPCP) houses two (2) dissolved air floatation (DAF) units for thickening of waste activated sludge (WAS) ahead of digestion. This project includes the replacement of Marshalltown's Water Pollution Control Plants the DAFs with two (2) new rotary drum thickener (RDT) units. One RDT will primarily be used for WAS thickening and the other RDT unit will serve as the standby WAS thickening unit and for thickening of digested sludge from 2.5% up to 7% solids. The polymer system, thickened sludge pumps, supporting electrical equipment, and HVAC equipment will be replaced with the project. The project also includes in-kind replacement of the Digester Transfer Pump for conveyance of digested sludge to the Thickened Sludge RDT.

The City of Marshalltown, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

Work under the proposed Contract Documents shall be commenced upon written Notice to Proceed anticipated to be issued within seven (7) days of the Effective Date of the Agreement

and shall be substantially complete on or before March 19, 2027 and fully complete on or before May 28, 2027, subject to any extension of time, which may be granted by the Owner.

PRE-BID CONFERENCE

Prospective bidders are encouraged to attend a pre-bid walk through of the proposed Work site which will be conducted jointly by the Owner and Engineer at 10:00 AM on February, 18, 2025 at Marshalltown WPCP. The objective of the walk through is to acquaint bidders with the site conditions.

OTHER PERTINENT INFORMATION

Each Bid shall be made on the Bid Form prepared for this purpose, which may be obtained from the Engineer. Any alteration in the official Bid Form will entitle the Owner, at its option, to reject the Bid from consideration. Each Bid shall be accompanied by a Bid Bond or a certified cashier's check, drawn on a solvent state or national bank, or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States, and filed in a sealed envelope separate from the one containing the Bid. The Bid Bond shall be substantially in the form set forth in the Contract Documents. The Contractor's certified check or Bid Bond shall be in an amount equal to five (5) percent of the amount of the Bid, made payable to the Owner. The check may be cashed for the full amount by the Owner or the Bid Bond forfeited in the full amount to the Owner as liquidated damages in the event the successful Bidder fails to enter into contract and file acceptable bonds satisfactory to the Owner assuring the faithful fulfillment of the contract and maintenance of said improvements as required by law within ten (10) days after the acceptance of the Bid.

The Owner reserves the right to reject any or all Bids, to readvertise for Bids or to defer action on the Bids received for a period not to exceed 30 days from and after the date and time specified in this Notice to Bidders for receiving said Bids, and to waive irregularities and informalities.

The successful Bidder will be required to furnish a Performance and Warranty Bond and a Payment Bond, each in an amount equal to one hundred (100) percent of the contract price. Said bonds to be issued by a responsible Surety approved by the Owner and shall guarantee that the Principal shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for or performing labor in the performance of the Work stated and the faithful performance of the contract and the terms and conditions therein contained and the guarantee and maintenance of said facilities in good repair and working conditions for not less than two (2) year(s) from the Notice of Acceptability of such improvements by the Owner.

Payment of the cost of said project will be made from cash on hand and/or received, payable from any fund or funds of Owner which may be legally used for such purpose, including, but not limited to, any of the following sources, or any combination thereof, at the sole discretion of Owner: (1) past and/or future earnings of Owner's utility; (2) proceeds of the sale and issuance of General Obligation Bonds and/or revenue bonds (or project notes anticipating the sale of such bonds); (3) federal, State or local grants or loans; and (4) proceeds from the sale of warrants, as authorized

HR Green, Inc.
Project No. 2303827

WPCP Sludge Thickening Improvements
Marshalltown, IA

by Section 384.57 of the Code of Iowa. Payments will be made to the Contractor in accordance with the Contract Documents.

Construction items and materials included in the Project are exempt from State of Iowa and Local Option Sales and Use Taxes. Contractor is responsible for obtaining the exemption on items included, as provided by law or for applying for reimbursement for such taxes paid. Contractor shall pay all other taxes required to be paid by Contractor in accordance with the laws and regulations of the place of the Project that are applicable during the performance of the Work. Contractor shall NOT include Sales and Use Tax in Contractor's bid. For more information on this exemption, please check the State of Iowa's website: www.state.ia.us/tax/business/Contr-ExEnt-Index.html

By virtue of statutory authority, preference will be given to products and provisions grown and coal produced within the State of Iowa, and to Iowa domestic labor, to the extent lawfully required under Iowa statutes provided that the award of contract will be made to the lowest responsible bidder submitting the lowest responsive bid, which shall be determined without regard to state or local laws whereby preference is given on factors other than the amount of the Bid.

The proposed Contract Documents are on file with the Owner and Engineer for public examination. Copies of said Contract Documents and one unbound copy of the Bid Form may be secured at the office of HR Green, Des Moines, 5525 Merle Hay Road Suite 200, Johnston, IA 50131, Phone Number 515-278-2913.

This public improvement is being constructed pursuant to the provisions of Chapters 26 and 573 of the latest edition of the Iowa Code, including revisions.

Published upon order of the City of Marshalltown.

City of Marshalltown

/s/ _____
Joel Greer, Mayor

ATTEST:

/s/ _____
Alicia Hunter, City Clerk

END OF SECTION 00110

SECTION 00120
NOTICE OF PUBLIC HEARING

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, PROPOSED FORM OF CONTRACT AND ESTIMATED COSTS FOR THE CONSTRUCTION OF PROJECT WPCP Sludge Thickening Improvements IN AND FOR THE City of Marshalltown, Marshalltown, IA 50158.

Notice is hereby given that there are on file with the Clerk, City of Marshalltown of the City of Marshalltown, Marshalltown, IA 50158, proposed drawings, project manual, proposed Form of Contract ("Contract Documents"), and opinion of probable cost for the construction of said improvement, for said Owner.

A hearing will be conducted thereon at a meeting of the City of Marshalltown to be held at 24 N. Center St., Marshalltown, IA 50158 at 5:30 PM, on February 24, 2025, at which time and place any person may appear and file objections to the proposed drawings, project manual, proposed Form of Contract ("Contract Documents"), and opinion of probable cost for the construction of said improvement.

Published upon order of the City of Marshalltown.

/s/ _____
Joel Greer, Mayor

ATTEST:

/s/ _____
Alicia Hunter, City Clerk

END OF SECTION 00120

SECTION 00200 INSTRUCTIONS TO BIDDERS

ARTICLE 1. DEFINED TERMS. Terms used in these Instructions to Bidders and the Notice to Bidders which are defined in the General Conditions have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a Bid to a Bidder.

ARTICLE 2. INTERPRETATIONS AND ADDENDA. All questions about the meaning or intent of the Contract Documents are to be directed to Engineer. Additions, deletions, or revisions to the Contract Documents considered necessary by the Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by the Engineer or Owner as having received the Contract Documents. Questions received less than ten (10) days prior to the date of Bids may not be answered. Only answers to such questions issued by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

- 2.1 Addenda may also be issued to make other additions, deletions, or revisions to the Contract Documents.

ARTICLE 3. BIDDER'S EXAMINATION OF CONTRACT DOCUMENTS AND SITE.

- 3.1 It is the responsibility of each Bidder before submitting a Bid:

- A. To examine thoroughly the Contract Documents and other related data identified in the Bidding Documents (including "technical" data referred to below);
- B. To visit the site to become familiar with local conditions that may affect cost, progress, or performance, of the Work;
- C. To consider federal, state, and local laws and regulations that may affect cost, progress, or performance of the Work;
- D. To study and carefully correlate the Bidder's observations with the Contract Documents; and
- E. To notify the Engineer of all conflicts, errors, ambiguities, or discrepancies in or between the Contract Documents and such other related data.

- 3.2 Reference is made to the Supplementary Conditions for identification of:

- A. Those reports of explorations and tests of subsurface conditions at the site which have been utilized by the Engineer in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such reports. However, the interpretation of such technical data, including any interpolation or extrapolation thereof, together with non-technical data,

interpretations, and opinions contained therein or the completeness thereof, is the responsibility of the Bidder.

- B. Those drawings of physical condition in or relating to existing surface and subsurface conditions (except Underground Utilities) which are at or contiguous to the site have been utilized by the Engineer in the preparation of the Contract Documents. The Bidder may rely upon the accuracy of the technical data contained in such drawings, however, the interpretation of such technical data, including any interpolation or extrapolation thereof, together with non-technical data, interpretations, and opinions contained in such drawings or the completeness thereof, is the responsibility of the Bidder.
- 3.3 Copies of reports and drawings referred to in Paragraph SC-5.03 of the Supplementary Conditions will be made available by the Owner to any Bidder at cost of reproduction, if copies are desired. Those reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which the Bidder is entitled to rely, as provided in Paragraph SC-5.03 of the Supplementary Conditions, are incorporated herein by reference.
- 3.4 Information and data reflected in the Contract Documents with respect to Underground Utilities at or contiguous to the site is based upon information and data furnished to the Owner and the Engineer by the owners of such Underground Utilities or others, and neither the Owner nor the Engineer assume responsibility for the accuracy or completeness thereof.
- 3.5 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Utilities, and other physical conditions, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in Paragraphs 5.03, 5.04 and 5.05 of the General Conditions.
- 3.6 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests, and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and Underground Utilities) at or contiguous to the site or otherwise which may affect cost, progress, or performance of the Work and which the Bidder deems necessary to determine its Bid for performing the Work in accordance with the time, price, and other items and conditions of the Contract Documents.
- 3.7 Upon request and a minimum of two (2) days' notice, the Owner will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests, and studies as each Bidder deems necessary for submission of a Bid. Location of any excavation or boring shall be subject to prior approval of Owner and applicable agencies. Bidder shall fill all holes, restore all pavement to match existing structural section, and shall clean up and restore the site to its former condition upon completion of such explorations.

- 3.8 The lands upon which the Work is to be performed, rights-of-way, and easements for access thereto and other land designated for use by the Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by the Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by the Owner unless otherwise provided in the Contract Documents.
- 3.9 The submission of a Bid will constitute an incontrovertible representation by the Bidder that the Bidder has complied with every requirement of this Article 3 and the following:
- A. That the Bid is premised upon performing and finishing the Work required by the Contract Documents without exception and applying such means, methods, techniques, sequences or procedures of construction (if any) as may be required by the Contract Documents;
 - B. That Bidder has given the Engineer written notice of all conflicts, errors, ambiguities, and discrepancies in the Contract Documents and the written resolutions thereof by the Engineer is acceptable to the Bidder; and
 - C. That the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performing and furnishing of the Work.

ARTICLE 4. BID FORM AND DELIVERY OF BID. Each prospective Bidder shall be furnished one copy of the Contract Documents and one separate unbound copy of the Bid Form and Bid Bond as stipulated in the Notice to Bidders. The unbound copy of the Bid Form is to be completed in ink and submitted with the Bid Bond. All names must be printed below the signatures.

Each Bid shall be submitted in a sealed envelope with "Bid Proposal" and the "Due" date clearly printed on the front. The Bid Bond shall be submitted in a separate sealed envelope with "BID BOND" clearly printed on the front. When sent by mail, the sealed Bid shall be addressed as follows:

City of Marshalltown
ATTN: City Clerk
24 N. Center St.
Marshalltown, IA 50158

The Bidder may attach a substitute Bid Form printed by a computer in lieu of completing the furnished Bid Form. If a substitute Bid Form is used, it shall be attached to the back side of the furnished Bid Form. Such computer printed substitute Bid Form shall include, but not limited to, the following at the top of each page:

- A. Project Title
- B. Project Number
- C. Letting Date

D. Bidder's Name and Address

The substitute computer printed Bid Form shall have column headings that include the Line Number, Item Description, Unit Designation, Approximate Quantity, Unit Bid Price, Amount Bid for each item, Total or Gross Sum Bid below the last Bid Item and Bidder's name, signature in ink and title at the end of the Bid Form. The signature and Total Gross Sum Bid shall also be written in ink on the furnished Bid Form.

Bids shall be filed prior to the time and at the place specified by the Notice to Bidders. Bid proposals received after the time for opening of Bids will be returned to the Bidder unopened.

In case of a discrepancy between the line number, Bid Item description, and/or quantity shown in the furnished proposal and those shown on the substitute computer printed Bid Form, the Bid Item description and the quantity shown in the furnished proposal shall govern. The Unit Bid Price shown on the substitute computer printed Bid Form shall govern whether or not the amount Bid shown is correct. The substitute Bid Form page size and size of printed characters shall be approximately the same as the furnished Bid Form. Solid lines for separating columns and line numbers need not be printed. Pages must be arranged and numbered the same as those contained in the furnished Bid Form. Any irregularities, which are not waived by the Owner as a technicality, will result in rejection of the Bid.

ARTICLE 5. DISQUALIFICATION OF BIDDERS.

Bids will be considered non-responsive and shall be rejected for any of the following reasons:

More than one Bid from an individual, firm, partnership, corporation or association under the same or different names will not be considered. If the Owner believes that any Bidder is interested in more than one Bid for the Work contemplated, all Bids in which such Bidder is interested will be rejected. If the Owner believes that collusion exists among the Bidders, all Bids will be rejected. A party who has quoted prices to a Bidder is not hereby disqualified from quoting prices to other Bidders, or from submitting a Bid directly for the Work.

If there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the proposal incomplete, indefinite or ambiguous as to its meaning, the Bid may be rejected.

If the Bidder submits an obviously unbalanced bid, the Bid may be rejected. An unbalanced bid shall be defined as a bid containing lump sum or unit bid prices which do not reflect reasonable actual costs plus a reasonable proportionate share of the Bidder's anticipated profit, overhead costs and other indirect costs to complete that bid.

ARTICLE 6. QUANTITIES OF WORK. The quantities of Work or material stated in additive items of the Bid are supplied only to give an indication of the general scope of the Work; the Owner does not expressly or by implication agree that the actual amount of Work or material will correspond therewith, and reserves the right after award to increase or decrease the quantity of any item of the Work by an amount up to and including 25 percent of any Bid item, without a

change in the unit price, and shall include the right to delete any Bid item in its entirety, or to add additional Bid items up to and including an aggregate total amount not to exceed 25 percent of the Contract Price.

ARTICLE 7. SUBSTITUTE OR "OR EQUAL" ITEMS. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a particular Supplier and the name is followed by the words "or equal", the procedure for the submittal of substitute or "Or equal" products is specified in Sections 01 2500 – Substitution Procedures and 01 6000 – Product Requirements.

Bidders wishing to obtain the Engineer's approval for alternative materials or equipment prior to the bid opening shall do so in writing at least 10 days prior to the opening of sealed bids. Approval, if granted, will be made in the form of an Addendum issued by the Engineer to all Planholders of record. If such approval is not granted prior to the opening of the bids, then consideration of the alternative may be made after award of the Contract if beneficial to the Owner.

ARTICLE 8. COMPETENCY OF BIDDERS. In selecting the lowest responsive, responsible Bidder, consideration will be given not only to the financial standing but also to the general competency of the Bidder for the performance of the Work covered by the Bid.

ARTICLE 9. SUBMISSION OF BIDS. The Bid shall be delivered by the time and to the place stipulated in the Notice to Bidders. It is the Bidder's sole responsibility to see that its Bid is received in proper time and at the proper place. Bidders shall hold bids for 30 days after the opening of bids.

ARTICLE 10. BID SECURITY, BONDS, AND INSURANCE. Each Bid shall be accompanied by a certified or cashier's check or share draft or approved Bid Bond in the amount stated in the Notice to Bidders. Said check or bond shall be made payable to the Owner and shall be given as a guarantee that the Bidder, if awarded the Work, will enter into Contract with the Owner, and will furnish the necessary insurance certificates, Payment Bond, Performance Bond, and any required Warranty Bond; each of said bonds to be in the amount stated in the Supplementary Conditions. In case of refusal or failure to enter into said Contract, the check or Bid Bond, as the case may be, shall be forfeited to the Owner. If the Bidder elects to furnish a Bid Bond as its Bid security, the Bidder shall use the Bid Bond form bound herein, or one conforming substantially to it in form. Bonds shall be issued by a surety authorized to do business in the State of Iowa. Checks or share drafts shall be certified or issued by a State or National bank, or a credit union in Iowa or chartered under the laws of the United States.

ARTICLE 11. DISCREPANCIES IN BIDS. In the event there is more than one Bid Item in a Bid Schedule, the Bidder shall furnish a price for all Bid Items in the Bid Form, and failure to do so will render the Bid non-responsive and may cause its rejection. In the event there are Unit Price Bid Items in a Bid Schedule and the amount indicated for a Unit Price Bid Item does not equal the product of the unit price and quantity, the unit price shall govern and the amount will be corrected accordingly, and the Bidder shall be bound by said correction. In the event there is more than one Bid Item in a Bid Schedule and the total indicated for the Schedule does not agree with the sum of the prices Bid on the individual items, the prices Bid on the individual items shall govern

and the total for the Schedule will be corrected accordingly, and the Bidder shall be bound by said correction.

ARTICLE 12. MODIFICATIONS AND UNAUTHORIZED ALTERNATIVE BIDS. Unauthorized conditions, limitations or provisos attached to the Bid shall render it informal and may cause its rejection as being non-responsive. The completed Bid Form shall be without interlineation, alterations or erasures in the printed text. Alternative Bids will not be considered unless called for. Oral, telegraphic or telephonic Bids or modifications will not be considered.

ARTICLE 13. WITHDRAWAL OF BID. A Bidder may request, without prejudice, to withdraw its Bid after it has been submitted to the Owner, provided such request is made in writing to the Owner prior to the time set for receiving Bids.

Modifications or corrections to Bids may be made on the withdrawn Bid provided such modifications or corrections are initiated by the Bidder and are received by the Owner prior to the time set for receiving Bids. Modifications or corrections to a Bid will not be accepted if the modifications or corrections render the bid security inadequate or if not accompanied by sufficient additional bid security.

If a Bidder has requested in writing to withdraw its Bid, said Bidder may submit a different Bid and bid security any time prior to the time set for receiving proposals.

ARTICLE 14. AWARD OF CONTRACT. Award of the contract, if awarded, will be made to the lowest responsive, responsible Bidder whose Bid complies with the requirements of the Contract Documents. Unless otherwise specified, any such award will be made within the period stated in the Notice to Bidders that the Bids are to remain open. Unless otherwise indicated, a single award will be made for all the Bid items in an individual Bid Schedule. The Owner reserves the right to reject any or all Bids, to waive any informality in a Bid and to select alternate additive or deductive Bid items as desired by the Owner to determine the award of the Contract.

ARTICLE 15. RETURN OF BID SECURITY. After the Bids are opened, verified, and duly considered, the bid security will be released pursuant to the current statutory provisions of the Iowa Code. Should the successful Bidder fail to enter into contract, the Bid guaranty shall be forfeited to the Owner to compensate for administrative expenses of making a re-award or issuing a new request.

ARTICLE 16. EXECUTION OF AGREEMENT. The Bidder to whom award is made shall execute a written Agreement with the Owner on the form of agreement provided, shall secure all insurance, and shall furnish all certificates and bonds required by the Contract Documents within ten (10) days after receipt of the Notice of Award from the Owner. Failure or refusal to enter into contract as herein provided or to conform to any of the stipulated requirements in connection therewith shall be just cause for annulment of the award and forfeiture of the Bid security. If the lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the Owner may award the Contract to the second lowest, responsive, responsible Bidder. If the second lowest responsive, responsible Bidder refuses or fails to execute the Agreement, the Owner may award the Contract to the third lowest, responsive, responsible Bidder.

ARTICLE 17. ADDENDA. Each Bid Form shall include specific acknowledgment, in the space provided in Section 00400, Bid Form, of receipt of all addenda issued and mailed by the Owner during the bidding period. Failure to so acknowledge may result in the Bid being rejected as not responsive.

ARTICLE 18. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION. The Contractor shall comply with all state and federal laws and county and local ordinances and regulations which in any manner affect those engaged or employed in the Work.

ARTICLE 19. PRE-BID CONFERENCE. A pre-bid conference will be held at a time and place stated in Section 00110, Notice to Bidders. Representatives of the Owner and Engineer will be present. A tour of the site will be conducted at the end of the conference. Meeting minutes and attendance list for the pre-bid conference will be made available to all those in attendance.

ARTICLE 20. LIQUIDATED DAMAGES. Provisions for liquidated damages, if any, are set forth in the Agreement and the Supplementary Conditions.

ARTICLE 21. FEDERAL TAX ID NUMBER. Each Bidder shall state its Federal Tax Identification Number on the line provided on the Bid Form. The Owner is required to report to IRS on Form 1099 all payments involving labor or services provided by vendors, and lack of this number may delay contract payments until the number is provided.

ARTICLE 22. LOCAL PREFERENCE. By virtue of statutory authority, preference will be given to materials, products, and supplies found or produced within the State of Iowa. Bidders resident in Iowa shall be allowed a preference over the Bid of any Bidder from any other state enforcing or having a preference for resident Bidders, equal to such preference.

The Bidder Status Form is required by the Iowa Labor Commissioner, pursuant to Iowa Administrative Code rule 875-156.2(1). The Bidder must complete the form and submit it with the bid. Failure to provide the Bidder Status Form with the bid may result in the bid being deemed non-responsive and may result in the bid being rejected. If the Bidder does not qualify as a resident bidder, the nonresident bidder shall specify on the Bidder Status Form whether any preference is given to resident bidders, including but not limited to the form of any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country is in effect in the nonresident bidder's state or country of domicile at the time of a bid submittal. Application of the preference against a non-resident bidder shall be in accordance with the information filed with the Proposal on the Bidder Status Form.

Such preferences will not be given where funding requirements, federal or otherwise, prohibit the giving of such preferences.

ARTICLE 23. BIDDER'S CERTIFICATION.

A. QUALIFICATION OF BIDDER:

Bidder shall certify that they are, at the time of bidding, and shall be, throughout the period of the contract, licensed in the State of Iowa. The Bidder shall provide its Iowa Contractor license number on the Bid Form. Bidder shall further certify that he is skilled and regularly engaged in the general class and type of work called for in the Contract Documents.

Bidder also certifies that they are knowledgeable of the unusual and peculiar hazards associated with the general class and type of work required to construct the specified project within the terms given in the Contract Documents.

Bidder shall be competent and skilled in the protective measures necessary for the safe performance of the construction Work with respect to such unusual and peculiar hazards.

END OF SECTION 00200

**SECTION 00400
BID FORM**

BID TO: City of Marshalltown
24 N. Center St.
Marshalltown, IA 50158

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with the Owner in the form included in the Contract Documents to perform the WORK as specified or indicated in said Contract Documents entitled:

WPCP Sludge Thickening Improvements

2. Bidder accepts all of the terms and conditions of the Contract Documents, including without limitation those in the Notice to Bidders and Instructions to Bidders, dealing with the disposition of the Bid Security.
3. Schedule of prices for construction of WPCP Sludge Thickening Improvements in accordance with the Contract Documents.

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1				\$	\$
2				\$	\$
3				\$	\$
4				\$	\$
5				\$	\$
6				\$	\$
7				\$	\$
8				\$	\$
TOTAL ITEM 1 THROUGH X					

4. Name of person who inspected site of proposed WORK for your firm:

Name: _____ Date of Inspection: _____

5. Bidder has examined copies of all the Contract Documents including the following addenda (receipt of all of which is hereby acknowledged):

Number	_____	Date	_____
	_____		_____
	_____		_____

6. Failure to acknowledge addenda may render the Bid non-responsive and be cause for its rejection. Bidder has familiarized itself with the nature and extent of the Contract Documents, WORK, site, locality where the WORK is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations), and the conditions affecting cost, progress or performance of the WORK and has made such independent investigations as Bidder deems necessary.
7. The Bidder hereby agrees to comply with the additional requirements listed below which are included in this proposal and identified as Bid Form attachments:

ITEM NO. DESCRIPTION OF ATTACHMENT

1. Bidder Status Form and Worksheet: Authorization to Transact Business

To all the foregoing, and including all Bid Forms contained in this Bid, said Bidder further agrees to complete the WORK required under the Contract Documents within the Contract Time stipulated in said Contract Documents, and to accept in full payment therefore the Contract Price based on the Total Bid Price(s) named in the aforementioned Bid Form.

Signed this _____ day of _____, 2025.

By: _____
(Firm Name)

(Signature)

(Typed or Printed Name)

(Title)

- (1) BIDDER's name and address:

- (2) BIDDER's telephone numbers, and e-mail address:

- (3) Federal Tax I.D. No.: Iowa Contractor License No.:

(DO NOT OMIT)

- (4) BIDDER's authorized agent for contract execution: _____
Name and Title
- (5) BIDDER's attesting agent for contract execution: _____
Name and Title
- (6) BIDDER's type of business: _____
(Corporation, partnership, individual, etc.)

END OF SECTION 00400

Bidder Status Form

To be completed by all bidders

Part A

Please answer "Yes" or "No" for each of the following:

☐ Yes ☐ No

My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).

☐ Yes ☐ No

My company has an office to transact business in Iowa.

☐ Yes ☐ No

My company's office in Iowa is suitable for more than receiving mail, telephone calls, and email.

☐ Yes ☐ No

My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.

☐ Yes ☐ No

My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders

Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: _____ / _____ / _____ to _____ / _____ / _____

Address: _____

City, State, Zip: _____

Dates: _____ / _____ / _____ to _____ / _____ / _____

Address: _____

City, State, Zip: _____

Dates: _____ / _____ / _____ to _____ / _____ / _____

Address: _____

City, State, Zip: _____

You may attach additional sheet(s) if needed.

City, State, Zip: _____

To be completed by non-resident bidders

Part C

1. Name of home state or foreign country reported to the Iowa Secretary of State:

2. Does your company's home state or foreign country offer preferences to resident bidders, resident labor force preferences or any other type of preference to bidders or laborers?

☐ Yes ☐ No

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all bidders

Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Signed Name: _____

Signature: _____

Firm Name: _____

Date: _____

Email Address: _____

Phone Number: _____

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

☐ Yes ☐ No

My business is currently registered as a contractor with the Iowa Division of Labor.

☐ Yes ☐ No

My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.

☐ Yes ☐ No

My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.

☐ Yes ☐ No

My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.

☐ Yes ☐ No

My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.

☐ Yes ☐ No

My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.

☐ Yes ☐ No

My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.

☐ Yes ☐ No

My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.

☐ Yes ☐ No

My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.

☐ Yes ☐ No

My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.

☐ Yes ☐ No

My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

SECTION 00430

BID BOND

KNOW ALL MEN BY THESE PRESENTS; That we _____,
of _____ as Principal, and _____ of _____,
as Surety, are held and firmly bound unto the City of
Marshalltown hereinafter referred to as the Obligee, in the penal sum of
_____, (\$_____) for which payment said Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents.

WHEREAS, the Principal is herewith submitting their sealed proposal for constructing the WPCP Sludge Thickening Improvements as described in Section 00110 Notice to Bidders.

Date of Letting: March 4, 2025

NOW THEREFORE, if the said proposal bid by said Principal is accepted, and the Principal shall enter into a contract with the Obligee in accordance with the terms of such bid, and shall post the Performance Bond, Payment Bond, and Warranty Bond required by the contract documents with good and sufficient surety for the faithful performance of such contract, for the prompt payment for all labor and material furnished in the prosecution thereof and for the maintenance of the improvements in good repair and specified working conditions for two (2) year(s) after substantial completion of the project by the Obligee, then this obligation shall become null and void, or in the event of the failure of the Principal to enter such contract and give such Performance Bond, Payment Bond, and Warranty Bond, the Principal and Surety on these bonds hereby agree to pay to the Obligee the full amount of this Bid Bond, together with court costs, attorney's fees, and any other expense of recovery.

IN WITNESS WHEREOF, the Principal and Surety have caused these presents to be signed this day of _____, 2025.

Principal

By _____

Contractor's Signature

Surety

END OF SECTION 00430

**SECTION 00510
NOTICE OF AWARD**

TO: _____

The extent of Work on this project is the furnishing of all labor, equipment, and materials for the construction of WPCP Sludge Thickening Improvements for the City of Marshalltown (Owner), generally described as follows:

The DAF Building at Marshalltown's Water Pollution Control Plant (WPCP) houses two (2) dissolved air floatation (DAF) units for thickening of waste activated sludge (WAS) ahead of digestion. This project includes the replacement of Marshalltown's Water Pollution Control Plants the DAFs with two (2) new rotary drum thickener (RDT) units. One RDT will primarily be used for WAS thickening and the other RDT unit will serve as the standby WAS thickening unit and for thickening of digested sludge from 2.5% up to 7% solids. The polymer system, thickened sludge pumps, supporting electrical equipment, and HVAC equipment will be replaced with the project. The project also includes in-kind replacement of the Digester Transfer Pump for conveyance of digested sludge to the Thickened Sludge RDT.

The Owner has considered the Bid submitted by you for the above-described Work.

You are hereby notified that your Bid has been accepted for items in the amount of WrittenContractAmount dollars, (\$ _____).

You are required by the Instruction to Bidders to execute the Agreement and furnish the required Contractor's Performance Bond, Payment Bond and Certificates of Insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said Bonds within ten (10) calendar days after the date of receipt of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the Owner.

Dated this _____ day of _____, 2025

City of Marshalltown

By _____

Title _____

ACCEPTANCE OF NOTICE

HR Green, Inc.
Project No. 2303827

WPCP Sludge Thickening Improvements
Marshalltown, IA

Receipt of the above NOTICE OF AWARD is hereby acknowledged by:

Contractor, this the ____ day of _____, 2025

By _____

END OF SECTION 00510

SECTION 00520 AGREEMENT

THIS AGREEMENT is dated as of the _____ day of _____, 2025, by and between the City of Marshalltown (hereafter called Owner) and Contractor (hereafter called Contractor).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

Contractor shall complete all Work as specified or indicated under the Contract Documents entitled WPCP Sludge Thickening Improvements generally described as follows:

The DAF Building at Marshalltown's Water Pollution Control Plant (WPCP) houses two (2) dissolved air floatation (DAF) units for thickening of waste activated sludge (WAS) ahead of digestion. This project includes the replacement of Marshalltown's Water Pollution Control Plants the DAFs with two (2) new rotary drum thickener (RDT) units. One RDT will primarily be used for WAS thickening and the other RDT unit will serve as the standby WAS thickening unit and for thickening of digested sludge from 2.5% up to 7% solids. The polymer system, thickened sludge pumps, supporting electrical equipment, and HVAC equipment will be replaced with the project. The project also includes in-kind replacement of the Digester Transfer Pump for conveyance of digested sludge to the Thickened Sludge RDT.

ARTICLE 2. CONTRACT TIMES.

With Notice to Proceed no later than when Construction Documents are verified to be compliant, all portions of the Work shall be substantially complete on or before March 19, 2027 and fully complete on or before May 28, 2027, subject to any extension of time, which may be granted by the Owner.

ARTICLE 3. LIQUIDATED DAMAGES.

Owner and the Contractor recognize that time is of the essence of this Agreement and that the Owner will suffer financial and other losses if the Work is not completed within the time specified in Article 2 herein, plus any extensions thereof allowed in accordance with Article 15 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal proceeding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, the Owner and the Contractor agree that as liquidated damages for delay (but not as a penalty) the Contractor shall pay the Owner \$1,000 dollars per calendar day (until Substantial completion); \$1,000 dollars per calendar day (until Final Completion) for each day that expires after the time specified in Article 2 herein.

ARTICLE 4. CONTRACT PRICE.

Owner shall pay Contractor for completion of the Work pursuant to the Contractor's Bid Form and in accordance with the Contract Documents in current funds as follows: _____dollars, (\$ _____).

ARTICLE 5. PAYMENT PROCEDURES.

Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

ARTICLE 6. ASSIGNMENT.

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

ARTICLE 7. CONTRACT DOCUMENTS.

The Contract Documents, which comprise the entire contract between Owner and Contractor concerning the Work, consist of this Agreement; Performance and Warranty Bond and Payment Bond; Notice to Proceed; General Conditions; Supplementary Conditions; and Drawings and Technical Specifications, Contractor's Bid Form, and all written amendments and other documents amending, modifying or supplementing the Contract Documents pursuant to paragraph 3.04 of the General Conditions, which may be fully executed after the effective date of the Agreement, for the said project.

IN WITNESS WHEREOF, Owner and contractor have caused this Agreement to be executed the day and year first above written.

City of Marshalltown

By:

Joel Greer, Mayor

By:

Contractor's Authorized Agent, Contractor's
Authorized Agent Title

HR Green, Inc.
Project No. 2303827

WPCP Sludge Thickening Improvements
Marshalltown, IA

CORPORATE SEAL

Attest:

Alicia Hunter, City Clerk

Attest:

Contractor's Attest, Contractor's Attest
Title

Address for giving notices

City of Marshalltown
24 N. Center St.
Marshalltown, IA 50158

Address for giving notices

END OF SECTION 00520

**SECTION 00550
NOTICE TO PROCEED**

TO: _____

DATE: _____

WPCP Sludge Thickening Improvements
City of Marshalltown
24 N. Center St.
Marshalltown, IA 50158

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 2025, on or after _____. Work under the proposed Contract Documents shall be substantially complete on or before March 19, 2027 and fully complete on or before May 28, 2027, subject to any extension of time, which may be granted by the Owner.

City of Marshalltown

By _____

Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by:

Contractor, this the _____ day of _____, 2025

By _____
CAuthorizedSignature, CAuthorizedTitle

END OF SECTION 00550

PERFORMANCE BOND

Contractor Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: <u>[City of Marshalltown]</u> Mailing address <i>(principal place of business)</i> : <u>[24 N. Center St., Marshalltown, IA 50158]</u>	Contract Description <i>(name and location)</i> : [WPCP Sludge Thickening Improvements], [Marshalltown, IA] Contract Price: Effective Date of Contract:
Bond Bond Amount: Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: ☒ None ☐ See Paragraph 16	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
 - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the

amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

- 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 - 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the

minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
14. Definitions
 - 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
 - 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
 - 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
 - 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
16. Modifications to this Bond are as follows: None

WARRANTY BOND

Contractor Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: <u>[City of Marshalltown]</u> Address <i>(principal place of business)</i> : <u>24 N. Center St., Marshalltown, IA 50158]</u>	Construction Contract Description <i>(name and location)</i> : [WPCP Sludge Thickening Improvements], [Marshalltown, IA] Contract Price: Effective Date of Contract: Contract's Date of Substantial Completion:
Bond Bond Amount: _____ Bond Period: Commencing 364 days after Substantial Date of Bond: _____ Completion of the Work under the Construction Contract, and continuing until [two] years after such Substantial Completion. Modifications to this Bond form: ☒ None ☐ See Paragraph 9	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Warranty Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
_____ <i>(Full formal name of Contractor)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract's Correction Period Obligations. The Construction Contract is incorporated herein by reference.
2. If the Contractor performs the Correction Period Obligations, the Surety and the Contractor shall have no obligation under this Warranty Bond.
3. If Owner gives written notice to Contractor and Surety during the Bond Period of Contractor's obligation under the Correction Period Obligations, and Contractor does not fulfill such obligation, then Surety shall be responsible for fulfillment of such Correction Period Obligations. Surety shall either fulfill the Correction Period Obligations itself, through its agents or contractors, or, in the alternative, Surety may waive the right to fulfill the Correction Period Obligations itself, and reimburse the Owner for all resulting costs incurred by Owner in performing Contractor's Correction Period Obligations, including but not limited to correction, removal, replacement, and repair costs.
4. The Surety's liability is limited to the amount of this Warranty Bond. Renewal or continuation of the Warranty Bond will not modify such amount, unless expressly agreed to by Surety in writing.
5. The Surety shall have no liability under this Warranty Bond for obligations of the Contractor that are unrelated to the Construction Contract. No right of action will accrue on this Warranty Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
6. Any proceeding, legal or equitable, under this Warranty Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and must be instituted within two years after the Surety refuses or fails to perform its obligations under this Warranty Bond.
7. Written notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown in this Warranty Bond.
8. Definitions
 - 8.1. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page of this Warranty Bond, including all Contract Documents and changes made to the agreement and the Contract Documents.
 - 8.2. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
 - 8.3. *Correction Period Obligations*—The duties, responsibilities, commitments, and obligations of the Contractor with respect to correction or replacement of defective Work, as set forth in the Construction Contract's Correction Period clause, EJCDC® C-700, Standard General Conditions of the Construction Contract (2018), Paragraph 15.08, as duly modified.
 - 8.4. *Substantial Completion*—As defined in the Construction Contract.
 - 8.5. *Work*—As defined in the Construction Contract.
9. Modifications to this Bond are as follows: **None**

PAYMENT BOND

Contractor Name: Address <i>(principal place of business)</i> :	Surety Name: Address <i>(principal place of business)</i> :
Owner Name: <u>[City of Marshalltown]</u> Mailing address <i>(principal place of business)</i> : <u>24 N. Center St., Marshalltown, IA 50158]</u>	Contract Description <i>(name and location)</i> : [WPCP Sludge Thickening Improvements], [Marshalltown, IA] Contract Price: Effective Date of Contract:
Bond Bond Amount: Date of Bond: <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: ☒ None ☐ See Paragraph 18	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
<i>(Full formal name of Contractor)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct contract with the Contractor
 - 5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim,

except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. Definitions

16.1. *Claim*—A written statement by the Claimant including at a minimum:

- 16.1.1. The name of the Claimant;
- 16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
- 16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
- 16.1.4. A brief description of the labor, materials, or equipment furnished;
- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
- 16.1.7. The total amount of previous payments received by the Claimant; and
- 16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
- 16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
- 17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
- 18. Modifications to this Bond are as follows: None

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared By



Endorsed By



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(800) 548-2723
www.asce.org

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GUIDELINES FOR USE OF EJCDC® C-700, STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

1.0 PURPOSE AND INTENDED USE OF THE DOCUMENT

EJCDC® C-700, Standard General Conditions of the Construction Contract (2018), is the foundation document for the EJCDC Construction Series. The General Conditions define the basic rights, responsibilities, risk allocations, and contractual relationship of the Owner and Contractor, and establish how the Contract is to be administered.

2.0 OTHER DOCUMENTS

EJCDC documents are intended to be used as a system and changes in one EJCDC document may require a corresponding change in other documents. Other EJCDC documents may also serve as a reference to provide insight or guidance for the preparation of this document.

These General Conditions have been prepared for use with either EJCDC® C-520, Agreement Between Owner and Contractor for Construction Contract (Stipulated Price), or EJCDC® C-525, Agreement Between Owner and Contractor for Construction Contract (Cost-Plus-Fee) (2018 Editions). The provisions of the General Conditions and the Agreement are interrelated, and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC® C-800, Supplementary Conditions of the Construction Contract (2018).

The full EJCDC Construction series of documents is discussed in the EJCDC® C-001, Commentary on the 2018 EJCDC Construction Documents (2018).

3.0 ORGANIZATION OF INFORMATION

All parties involved in a construction project benefit significantly from a standardized approach in the location of subject matter throughout the documents. Experience confirms the danger of addressing the same subject matter in more than one location; doing so frequently leads to confusion and unanticipated legal consequences. Careful attention should be given to the guidance provided in EJCDC® N-122/AIA® A521, Uniform Location of Subject Matter (2012 Edition) when preparing documents. EJCDC® N-122/AIA® A521 is available at no charge from the EJCDC website, www.ejcdc.org, and from the websites of EJCDC's sponsoring organizations.

If CSI MasterFormat™ is used for organizing the Project Manual, consult CSI MasterFormat™ for the appropriate document number (e.g., under 00 11 00, Advertisements and Invitations), and accordingly number the document and its pages.

4.0 EDITING THIS DOCUMENT

Remove these Guidelines for Use. Some users may also prefer to remove the two cover pages.

Although it is permissible to revise the Standard EJCDC Text of C-700 (the content beginning at page 1 and continuing to the end), it is common practice to leave the Standard EJCDC Text of C-700 intact and unaltered, with modifications and supplementation of C-700's provisions set forth in EJCDC® C-800, Supplementary Conditions of the Construction Contract (2018). If the Standard Text itself is revised, the

user must comply with the terms of the License Agreement, Paragraph 4.0, Document-Specific Provisions, concerning the tracking or highlighting of revisions. The following is a summary of the relevant License Agreement provisions:

1. The term “Standard EJCDC Text” for C-700 refers to all text prepared by EJCDC in the main body of the document. Document covers, logos, footers, instructions, or copyright notices are not Standard EJCDC Text for this purpose.
2. During the drafting or negotiating process for C-700, it is important that the two contracting parties are both aware of any changes that have been made to the Standard EJCDC Text. Thus, if a draft or version of C-700 purports to be or appears to be an EJCDC document, the user must plainly show all changes to the Standard EJCDC Text, using “Track Changes” (redline/strikeout), highlighting, or other means of clearly indicating additions and deletions.
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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
- 11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
 - 12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
 - 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 - 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
 - 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 - 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 - 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 - 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 - 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 - 20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 - 21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
- 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
- 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
 - 1. Observations by Engineer;
 - 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. Use or occupancy of the Work or any part thereof by Owner;
 - 5. Any review and approval of a Shop Drawing or Sample submittal;
 - 6. The issuance of a notice of acceptability by Engineer;
 - 7. The end of the correction period established in Paragraph 15.08;
 - 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 Delegation of Professional Design Services

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

- B. *Change Proposal Procedures*

- 1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
- 2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

- 3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
- 4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work does not include any of the following items:
 - 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
 - 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 6. Expenses incurred in preparing and advancing Claims.
 - 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee*
 - 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
 - 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
- 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

PROSUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

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ARTICLE 1—ARTICLE 1--DEFINITIONS AND TERMINOLOGY

SC-1.01.A.41 – Add the following new paragraph immediately after Paragraph 1.01.A.41

In addition to the definition provided in the General Conditions, the following applies: Sufficient completion of the project or the portion thereof to permit utilization of the project, or portion thereof for its intended purpose. Substantial completion requires not only that the work be sufficiently completed to permit utilization, but that the Owner can effectively utilize the substantially completed Work. Determination of substantial completion is solely at the discretion of the Owner. Substantial completion does not mean complete in accordance with the Contract nor shall substantial completion of all or any part of the project entitle the Contractor to acceptance under the Contract.

SC-1.01.A.51 – Add the following new paragraphs immediately after Paragraph 1.01.A.50:

51. Conflict - A case where an item of Work is shown or specified differently in two or more places in the Contract Documents. An item of Work shown in one portion of the Contract Documents but not in another is not a Conflict.

52. Consultant - HR Green, Des Moines

53. Engineer - Joe Frankl, Project Manager, 5525 Merle Hay Road Suite 200, Johnston, IA 50131, Phone: 515-278-2913.

ARTICLE 2—PRELIMINARY MATTERS

SC2.05.A.1 Delete Paragraphs 2.05.A.1 in its entirety and insert the following in its place:

The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. The Progress Schedule, in a detailed precedence-style critical path method (CPM) or Primavera type format satisfactory to the Owner, shall: (a) provide a graphic representation of all activities and events that will occur during the performance of the Work; (b) identify each phase of construction and occupancy; and (c) set forth milestone dates that are significant to ensure the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefore.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

No Supplementary Conditions for this Article.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01.A – Delete the last sentence of paragraph.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 Subsurface and Physical Conditions

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
None		

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
Dissolved Air Flotation and Sludge Vehicle Storage Building	1980	Background Drawings
Waste Treatment Plant Improvements	1986	Background Drawings
Biosolids Improvements	2002	Background Drawings
Peak Holding and Pumping Improvements	2010	Background Drawings

- G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at the Owner's office during regular business hours, or may request copies from Engineer.

5.06 Hazardous Environmental Conditions

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
None		

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
None		

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the forms substantially similar to EJCDC® C-610, Performance Bond (2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form substantially similar to EJCDC® C-615, Payment Bond (2018 edition).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be **[2]** years after Substantial Completion.
2. After Substantial Completion, Contractor shall furnish a warranty bond. The warranty bond must be in a bond amount of **[15]** percent of the final Contract Price. The warranty bond period will extend to a date **[2]** years after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final application for payment, and in any event no later than 11 months after Substantial Completion.
3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

6.02 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, and Jones Act

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	\$1,000,000

Workers' Compensation and Related Policies	Policy limits of not less than:
Bodily injury by disease—aggregate	\$1,000,000
Employer's Liability	
Each accident	\$1,000,000
Each employee	\$1,000,000
Policy limit	\$1,000,000

- F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
 2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

- H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of “insured contract” (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured’s vicarious liability, strict liability, or statutory liability (other than worker’s compensation).
 6. Any limitation or exclusion based on the nature of Contractor’s work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.
- I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$2,000,000
Products—Completed Operations Aggregate	\$2,000,000
Personal and Advertising Injury	\$1,000,000
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000

- J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$1,000,000
Each Accident	\$1,000,000
Property Damage	
Each Accident	\$1,000,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$2,000,000

- K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general

liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$2,000,000
General Aggregate	\$2,000,000

- L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of \$2,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.
- M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	\$2,000,000
General Aggregate	\$2,000,000

- N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	\$1,000,000
Annual Aggregate	\$1,000,000

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).
 - a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.
 - b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.
2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).
4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
5. extend to cover damage or loss to insured property while in transit.
6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.
7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.
8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.
10. include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Contractor, and Subcontractors of every tier, include as insureds the following:
 - a. City of Marshalltown
 - b. HR Green
11. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:
 - a. None

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provision:

- G. *Coverage for Completion Delays:* The builder's risk policy will include, for the benefit of Owner, loss of revenue and soft cost coverage for losses arising from delays in completion that result from covered physical losses or damage. Such coverage will include, without limitation, fixed expenses and debt service for a minimum of 12 months with a maximum deductible of 30 days, compensation for loss of net revenues, rental costs, and attorneys' fees and engineering or other consultants' fees, if not otherwise covered.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

- H. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.
 1. The builder's risk policy (or if applicable the installation floater) will be subject to a deductible amount of no more than \$100,000 for direct physical loss in any one occurrence.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.02 Supervision and Superintendence

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be **[Monday through Friday, 8 a.m. – 4:30 p.m.]**.
2. Owner's legal holidays are [the first day of January, commonly known as New Year's Day; the third Monday in January, known as Martin Luther King Day; the third Monday in February, known as President's Day; the Friday before Easter Sunday known as Good Friday; the last Monday in May, known as Memorial Day; the Fourth day of July, known as Independence Day; the first Monday in September, known as Labor Day; the fourth

Thursday in November, known as Thanksgiving Day; the fourth Friday in November known as the day after Thanksgiving; and the twenty-fifth day in December, known as Christmas Day.

When an official holiday falls on Sunday, the following Monday shall be designated as a substitute holiday, and observed as an official holiday. When an official holiday falls on a Saturday, the preceding Friday shall be designated as a substitute holiday, and observed as an official holiday].

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

- D. **[Contractor]** shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.07.B – Delete paragraph in its entirety and insert "Deleted".

SC-7.07A – Add the following to Paragraph 7.07.A

No later than 14 days prior to the commencement of the Work, the Contractor shall furnish the Owner, in writing, with (1) the name, trade, and subcontract amount of each Subcontractor and (2) the names of all persons or entities proposed as manufacturers of the products identified in the specifications (including those who are to furnish materials or equipment fabricated to a special design) and, where applicable, the name of the installing Subcontractor

SC-7.07M Add the following paragraph as 7.07.M:

- C. The Contractor or competent Superintendent must be on the Project when construction activities are taking place. The Superintendent shall supervise, direct, and control the contractor's operations, personnel, work and the Subcontractor's operations. The Contractor shall give the Owner and Engineer written notification of the name of the Superintendent. The Superintendent shall be employed by the General Contractor and shall be assigned to the project full-time. The Superintendent shall be incidental to mobilization. A copy of the Drawings and Specifications shall be available on the project site at all times.
- D. Contractor shall maintain a qualified and responsible person available 24 hours per day, seven days per week to respond to emergencies which may occur after hours. Contractor shall provide to Engineer the phone number and/or paging service of this individual.

7.10 Taxes

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

- A. Construction items and materials included in the Project are exempt from State of Iowa and Local Option Sales and Use Taxes. Contractor is responsible for obtaining the exemption on items included, as provided by law or for applying for reimbursement for such taxes paid. Contractor shall pay all other taxes required to be paid by Contractor in accordance with the

laws and regulations of the place of the Project that are applicable during the performance of the Work. Contractor shall NOT include Sales and Use Tax in Contractor's bid. For more information on this exemption, please review the State of Iowa's website: www.state.ia.us/tax/business/Contr-ExEnt-Index.html

SC-7.17 Add the following new paragraph 7.17.F immediately after Paragraph 7.17.G

F. Contractor represents and warrants to the Owner that Contractor

1. is experienced and skilled in the construction of structures and improvements of the type described in the Contract Documents and

2. has, by careful examination, satisfied itself as to and has taken into account

(a.) the nature, location and character of the project site, including, without limitation, the surface and subsurface (by review of available reports and information) condition of the land and all structures and obstructions thereon, both natural and man-made, and all surface and subsurface (to the extent reasonably identified by review of available reports and information) water conditions of the Project site and the surrounding area;

(b) the nature, location and character of the general area in which the Project site is located; and

(c) all other matters or things which, in the reasonable judgment of the Contractor, could in any manner affect the performance of the Work

ARTICLE 8—OTHER WORK AT THE SITE

No Supplemental Conditions for this Article.

ARTICLE 9—OWNER'S RESPONSIBILITIES

No Supplementary Conditions in this Article.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 Resident Project Representative

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with the Owner, the Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
 2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.
 3. *Liaison*
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
 4. *Review of Work; Defective Work*
 - a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Observe whether any Work in place appears to be defective.
 - c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
 5. *Inspections and Tests*
 - a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
 - b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
 6. *Payment Requests:* Review Applications for Payment with Contractor.
 7. *Completion*
 - a. Participate in Engineer's visits regarding Substantial Completion.
 - b. Assist in the preparation of a punch list of items to be completed or corrected.
 - c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
 - d. Observe whether items on the final punch list have been completed or corrected.
- D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).
2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

For purposes of this paragraph, “small tools and hand tools” means any tool or equipment whose current price if it were purchased new at retail would be less than \$500.

13.02 *Allowances*

SC-13.02 Supplement Paragraph 13.02.C by adding the following:

Owners’ contingency allowance is to be used as a general allowance for unanticipated costs, not to exceed \$25,000.

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

- a. the extended price of a particular item of Unit Price Work amounts to [5] percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than [10 / 25] percent from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
 3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No suggested Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01.D.1 - Delete paragraph in its entirety and insert the following in its place:

1. Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

SC-15.01 Add the following new Paragraph 15.01.F:

- F. For contracts in which the Contract Price is based on the Cost of Work, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

15.03 *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

2. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-

inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

SC-15.03.G Add the following paragraph to Paragraph 15.03

G. Substantial Completion means that the project improvements are complete to the point that they have been put back on-line with complete automatic operation. In particular, to meet Substantial Completion, all equipment shall have successfully completed startup, testing, manufacturers field services and training; and instrumentation and controls must be installed and fully operational. Any temporary arrangements must be satisfactory to the Engineer.

To be considered substantially complete, the following portions of the Work must be operational and ready for Owner's continuous use as intended:

- Successful installation, commissioning, training, and completion of performance testing as described in the Contract Documents for new RDTs and new RDT polymer feeder/blenders.
- Successful installation, commissioning, training, and startup of all new pumps.
- Yard piping, structures, and valves installed and tested.
- Installation, commissioning, testing, and training of all electrical and mechanical systems.
- Installation, commissioning and training for instrumentation and controls.
- O&M Manuals shall be completed and submitted in final form

SC-15.04.A Add the following paragraph to Paragraph 15.04.A

5. Issuance of a certificate of Substantial Completion per Contractor request under 15.04.A.2 above shall not accelerate or begin the warranty period for that portion of work confirmed as substantially complete.

SC-15.07.A Add the following paragraph to Paragraph 15.04.A

15.08 *Correction Period*

SC-15.08 Add the following new Paragraph 15.08.G:

- G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in SC-6.01.B.1;

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.03 Attorneys' Fees

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. [Note: If there is no Paragraph 17.02, because no arbitration is in the Supplementary Conditions, then revise this to state "Add the following new Paragraph immediately after Paragraph 17.01" and revise the numbering accordingly].

17.03 Attorneys' Fees

- A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18—MISCELLANEOUS

No suggested Supplementary Conditions in this Article.

ARTICLE 19—FEDERAL REQUIREMENTS

No suggested Supplementary Conditions in this Article.

ARTICLE 20—ADDITIONAL STATE / LOCALITY REQUIREMENTS

No suggested Supplementary Conditions in this Article.

**SECTION 01 1000
SUMMARY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Information.
- B. Quality Assurance.
- C. Commencement of the Work.
- D. Owner Occupancy.
- E. Contractor Use of Site and Premises.
- F. Layout of the Work.
- G. Work Sequence.
- H. Schedule of Values.
- I. Startup and Training.
- J. Permits, Fees and Notices.
- K. Safety and Protection

1.02 PROJECT INFORMATION

- A. Project Name: Marshalltown Sludge Thickening Improvements.
- B. Owner's Name: City of Marshalltown, IA.
 - 1. Address: 1001 Woodland Street, Marshalltown, IA, 50158.
- C. Engineer's Name: HR Green, Inc.
 - 1. Address: 5525 Merle Hay Road, Suite 200, Johnston, IA 50131-1448
 - 2. Phone: (515) 278-2913
 - 3. Fax: (713) 965-0044
- D. The Project consists of:
 - 1. Furnish all labor, materials, and equipment necessary to complete rotary drum thickener (RDT) installation including but not limited to the following: demolition, addition of two (2) RDT units, RDT polymer system addition, replacement of digester transfer pump, process piping, mechanical, electrical, controls, and subsidiary work in accordance with the Contract Documents.

1.03 QUALITY ASSURANCE

- A. Supervision and Superintendent:
 - 1. The Contractor or competent Superintendent must be on the Project site when construction activities are taking place. The Superintendent shall supervise, direct, and control the Contractor's operations, personnel, work and the Subcontractor's operations. The Contractor shall give the Owner and Engineer written notification of the name of the Superintendent. The Superintendent shall be employed by the General Contractor and shall be assigned to the project full-time. The Superintendent shall be incidental to mobilization. A copy of the Contract Drawings and Specifications shall be available on the project site at all times.
 - 2. Contractor shall maintain a qualified and responsible person available 24 hours per day, seven days per week to respond to emergencies which may occur after hours. Contractor shall provide to Engineer the phone number and/or paging service of this individual.
 - 3. Incompetent or incorrigible employees shall be dismissed from Work by Contractor or its representative when requested by Engineer, and such persons shall not again be permitted to return to Work without written consent of Engineer.

1.04 COMMENCEMENT OF THE WORK

- A. The Contractor shall not commence Work nor allow Subcontractors or Sub-subcontractors to commence Work until:
 - 1. The Agreement has been fully executed.
 - 2. The Owner has approved the Contractor's Performance and Maintenance and Payment Bonds.
 - 3. The Owner has approved evidence of the Contractor's Liability Insurance and other insurance required to be purchased by the Contractor.
 - 4. The Engineer, on behalf of the Owner, has issued a Notice to Proceed.

1.05 OWNER OCCUPANCY

- A. The Owner shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding the time for completing the entire work or such portions as may not have expired; but such taking, possession and use shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents.
 - 1. If such prior use increases the cost of, or delays the Work, the Contractor shall be entitled to such extra compensation or extension of time, or both, as the Engineer may determine.
- B. Owner intends to continue to occupy adjacent portions of the existing buildings during the entire construction period.
 - 1. Treatment plant must be maintained in operation throughout the entire construction period, with planned and scheduled shutdowns for connections, cut-ins, changeovers, etc.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy and operations.
- E. Continuity of treatment system operation.
 - 1. Conduct work in a manner that avoids interruption of effective treatment system operation.
 - 2. Prevent the bypass of untreated wastewaters to surface water or drainage ways. Accidental bypasses caused by Contractor's work activity will entitle Owner to:
 - a. Employ others to stop bypassing without giving notice to Contractor.
 - b. Recover from the Contractor all costs incurred by the Owner as a result of the bypass, including labor, materials, services, legal fees, regulatory penalties, and other related expenses.
 - 3. Submit with the Construction Schedule a detailed outage plan and schedule for each system component. Indicate how effective wastewater system operation will be maintained.

1.06 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Limit use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by Others.
 - 3. Work by Owner.
 - 4. Engineer.
 - 5. Resident Project Representative.
- C. All City properties are tobacco free, and policy will be enforced.
- D. Provide access to and from site as required by law and by Owner.
- E. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.

1.07 LAYOUT OF THE WORK

- A. The Owner shall provide information to the Contractor regarding bench marks for the project. The Contractor shall be responsible for all detailed construction staking.

1.08 PRESELECTED EQUIPMENT

- A. The price specified herein for certain preselected equipment shall be used by the Contractor in preparation of the bid. The Contractor shall add to its bid all other expenses, overheads, profits, and costs necessary to correct for any differences between the proposal and the contract requirements for the installation and startup of the following preselected equipment.
- B. The proposal in attachment following this Section for the preselected equipment are for reference only and are not part of the Contract. The proposal shall establish a base price for the preselected equipment, but the actual terms of the purchase agreement between the Contractor and its supplier shall be negotiated between the two parties to arrive at a mutual agreement of responsibilities to be shared which comply with the requirements of the Contract Documents.
- C. Preselected Equipment:
 - 1. The Rotary Drum Sludge Thickening System specified in Section 46 7133 shall be furnished by BDP Industries Inc. Contractor may submit alternative RDT manufacturer per specification Section 01 2500 - Substitution Procedures if it can meet the design and layout requirements. The Rotary Drum Sludge Thickening System shall be furnished to the Contractor for a total lot net selling price of \$588,500 f.o.b. shipping point. This price is firm until 04/16/2025. The proposal by BDP Industries Inc. to furnish this equipment is bound in Attachment A following this section.
- D. The price specified herein for certain preselected equipment shall be used by the Contractor in preparation of the bid. The Contractor shall add to their bid all other expenses, overheads, profits, and costs necessary to correct for any differences between the manufacturers proposal and the contract requirements for the installation and startup of the preselected equipment.
- E. The proposal in Attachment A following this section for the preselected equipment is for reference only and is not part of the Contract. The proposal shall establish a base price for the preselected equipment, but the actual terms of the purchase agreement between the Contractor and its supplier shall be negotiated between the two parties to arrive at a mutual agreement of responsibilities to be shared which comply with the requirements of the Contract Documents.

1.09 WORK SEQUENCE

- A. All portions of work under the proposed Contract Documents shall be completed and ready for operation on or before the date set forth in the Notice to Bidders. Provisions for liquidated damages are set forth in the Contract.
- B. Construct Work in stages to accommodate Owner's occupancy and operational requirements during the construction period. Coordinate construction schedule and operations with Owner.
- C. Prior to starting construction, Contractor shall submit a detailed sequencing plan which will permit the facilities to function as normal as practical during the construction period. It is understood that equipment lead times may be substantial and will affect the proposed sequence. Contractor shall not begin construction activities until the sequencing plan has been approved by the Engineer and Owner's representative.
- D. Contractor shall notify Owner's representative and Engineer a minimum of 7 calendar days in advance of any approved shutdowns.
- E. The Contractor shall minimize downtime of all utilities and limit shutdowns to less than two (2) hours unless otherwise specified herein or approved by Owner.
- F. The following requirements shall be met at all times unless approved otherwise:
 - 1. Both RDT units, associated polymer feed, and new MCC-F shall be installed and fully operational before the second DAF is taken out of service for removal.
 - 2. A unit shall be considered out of service if any construction or removals affect the operation of the unit.
 - 3. Existing DAF polymer feed systems, air compressor, and associated items for proper operation of the DAF need to be maintained until the last existing DAF is removed.
 - 4. One (1) DAF unit or two (2) RDT units must be operational at all times.

5. Digested sludge pumping operations and WAS thickening operation outages shall be a maximum of 3 consecutive days, respectfully. Contractor shall coordinate with the Owner to drain the existing yard piping and sludge storage tank #4 as necessary to complete the work.
- G. The following suggested general construction sequence may be followed:
 1. Place new conduit and conductors for Digester Transfer Pump (DTP-1050) between Digester Control Building basement and existing MCC-L in the Boiler Building.
 2. Install Digester Transfer Pump VFD in MCC-L in the Boiler Building.
 3. Install modifications in SPCP-L for Digester Transfer Pump VFD connections.
 4. Disconnect and remove the existing Digester Transfer Pump, piping, and associated device conduit and conductors back to MCC-C as indicated in the Contract Drawings.
 5. Install new Digester Transfer Pump (DTP-1050) and associated piping and valves. Complete the electrical installation for the new pump. Startup and commission the new Digester Transfer Pump.
 6. Isolate and remove three (3) existing buried plug valves (12", 12" and 8") and necessary piping south of existing Sludge Storage Tank #4. Install new piping, valves, and precast valve vault as indicated on the Contract Drawings.
 7. Isolate and remove one (1) existing buried plug valve (8") and necessary piping between existing Sludge Storage Tank #4 and the Secondary Digesters. Install and pressure test new digested sludge piping, valve, and precast manhole as indicated on the Contract Drawings. Temporarily cap the piping at the buried to exposed transition on the south side of the RDT building.
 8. Isolate and remove 12-inch piping between existing Sludge Storage Tank #4 and the Secondary Digesters. Install and pressure test new thickened sludge piping as indicated on the Contract Drawings. Temporarily cap the piping at the buried to exposed transition on the south side of the RDT building. Sludge storage operations back online.
 9. Repair disturbed sidewalk affected by yard piping work in accordance with the Contract Drawings.
 10. Connect and install new sample sink in the RDT Building.
 11. Isolate, remove and dispose of existing north DAF unit (DAF #1), associated equipment, piping, valves, exhaust fan and ductwork associated with DAF #1. The south DAF (DAF #2), existing MCC-F and SPCP-F, and existing polymer feeder/blender shall remain in-service for WAS thickening operations.
 12. Repair any damage to existing slab beneath DAF #1 in accordance with Contract Drawings.
 13. Paint the interior walls of the RDT room in accordance with the Contract Drawings.
 14. Install new polymer feeder/blenders, totes, and piping in accordance with the Contract Drawings. Cap the polymer solution piping for future connection to the RDTs once they are installed.
 15. Install both RDT-1130 and RDT-1230, supports, floc tanks, booster pumps, associated sludge pumps (TWASP-1151 and TSP-1251), associated piping, and valves in the RDT room. Connect polymer solution piping. Connect non-potable water piping.
 16. Connect to the yard piping to the south of the RDT Building. Short outage required for digested sludge pumping during the tie-in.
 17. Install new roof-mounted exhaust fans for RDTs.
 18. Install new electrical equipment in the RDT room including MCC-F, ICP-F, CP-F, and MCPs.
 19. Intercept existing feeder and install junction box. Connect feeder to new MCC-F and refeed existing MCC-F. Intercept existing communication conduit and install new communication cable to CP-F. Install temporary communication connection from new CP-F to existing SPCP-F.
 20. Install conduits and conductors as much as possible to the new equipment. Install junction boxes and transfer building loads from existing MCC-F and associated power panels to new MCC-F and new power panels.
 21. Disconnect and remove first WAS pump. Install new wiring connections and pump for first WAS Pump to new MCC-F and CP-F.

22. Complete startup and commissioning for both new RDTs and polymer feeder/blenders. Thickening operations online with the new RDTs.
 23. Disconnect and remove second WAS pump. Install new wiring connections and pump to new MCC-F and CP-F.
 24. Shutdown existing MCC-F and SPCP-F.
 25. Remove and dispose of existing MCC-F and SPCP-F.
 26. Isolate, remove and dispose of existing south DAF unit (DAF #2), associated equipment, piping, valves, DAF polymer feeder/blender system, exhaust fan, ductwork associated with DAF #2, and all other ductwork in the RDT Room.
 27. Repair any damage to existing slab beneath DAF #2 in accordance with Contract Drawings.
 28. Install new makeup air unit, heat exchanger, associated heating water piping, ductwork and roof-mounted exhaust fan (EF-1080) for RDT Room.
- H. Existing isolation valves are not guaranteed to function. The Contractor shall be responsible for any additional isolation materials required for construction sequencing. The Contractor shall be responsible for isolating piping as necessary to facilitate replacement, including installing temporary blind flanges or pancake blinds.
- I. The Contractor shall schedule Work so that interruption of existing utilities, including but not limited to: electric, telephone, communication, cable, gas, water, and sewer service will be at a minimum. When it is necessary to interrupt services, the Contractor shall notify the Owner's representative, Engineer, and appropriate utility companies seven (7) calendar days in advance of the interruption.
- J. It may be necessary to do certain parts of the construction work outside normal working hours and on Sundays in order to avoid undesirable conditions, and it shall be the obligation of the Contractor to do this work at such times at no additional cost to the Owner. Do not make connections between existing piping and new piping until necessary inspection and tests have been completed on the new work and it is found to conform in all respects to the requirements of the drawings and specifications.
- K. Special notes detailing critical portions of the work involving removal, replacement, tie-in, changeover, etc. have been included in the drawings and the Work Sequence of this Section. These notes describe the work, timing, scheduling, and coordination with the Owner and Engineer necessary to complete the work. The detailed construction schedule shall be developed by the Contractor with consideration of these details and the overall progress of the work. The Engineer and Owner shall have full authority to review this schedule in order to protect the operation of the existing facilities during construction.

1.10 SCHEDULE OF VALUES

- A. Where a Contract is awarded on a lump sum basis, the Contractor shall file with the Engineer a balanced price segregation of the lump sum bid into items similar to the various subdivisions of the general and detailed specifications, the sum of which shall equal the lump sum bid.
1. The cost of various materials shall be furnished upon request of the Engineer, and such data will then be used as a basis for making progress estimates.
 2. Breakdown costs, itemized by Specification Section and trade, and distribute cost to individual applicable units and structures.
 3. Where structures, units, equipment or other components are identified by a specific series or, identification number, utilize said designation throughout cost breakdown.
 4. Provide detailed breakdown for individual yard piping or conduit runs and identify approximate quantities involved to satisfaction of the Engineer.
 5. Provide separate breakdown for change order items requested.
 6. Provide an additional breakdown sheet, equivalent to EJCDC document C620, Page 3 of 3, showing the tabulation format for stored materials.
 7. Submit this sheet each month with Contractor's pay request breakdown.
- B. Contractor's costs shall not govern the allocation of values when application of Contractor's costs to a component part of the Work results in any other component or combination of component parts being under-valued in relation to conventional estimating guides.

1. The detail and format of cost breakdown and stored materials tabulation sheet shall be fully approved by Engineer.
- C. A reasonable allocation of the Contract Price to the component parts of the Work will be approved if component parts of the Work have values assigned to them that are well- balanced with respect to relative values for similar work established by published estimating guides.
 1. Unless otherwise agreed to at the Preconstruction Conference, Means Estimator Guide or other similar nationally recognized estimating guide shall be used for resolving differences between Engineer's and Contractor's opinions of allocation of values.
 2. Consent of Surety: If Contractor and Engineer cannot mutually agree on a Schedule of Values, Engineer will approve a Schedule of Values approved by the Surety providing the Performance Bond.
- D. Schedule of Values shall be agreed upon prior to first Application for Payment.

1.11 STARTUP AND T

- A. See individual equipment specifications for item specific and additional requirements.
- B. Contractor shall coordinate with Owner to schedule each training thirty (30) days in advance.
- C. Unless otherwise noted in individual equipment specifications, provide separate training sessions for operations and maintenance staff for each piece of equipment over two (2) day period.
- D. Owner training shall not occur until:
 1. All submittals, operation and maintenance manuals have been approved by WRA.
 2. All controls are complete and tested.
 3. All equipment has received a certificate of successful startup from the manufacturer's representative and certificate submitted to WRA.
 4. Commissioning periods shall be completed after training.

1.12 PERMITS, FEES AND NOTICES

- A. The Contractor shall secure and pay for all permits and governmental fees, licenses and inspections for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which were legally required at the time bids were received. City building permits and inspections are required, but the permit fees will be exempted.

1.13 SAFETY AND PROTECTION

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
 1. All persons on the Site or who may be affected by the Work;
 2. All the work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor.

- D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 1000

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354 State Route 29 Greenwich, New York 12834
Phone No 518-695-6851
dan@bdpindustries.com

Date: Thursday, January 30, 2025

To: HRGreen
5525 Merle Hay Road, Suite 200
Johnston, IA 50131

Attn: Erik Rasmussen
(515) 278-2913
Erik.rasmussen@hrgreen.com

Re: Marshalltown, IA
Two (2) BDP Industries Model 4x10 RDT - Rotary Drum Thickeners
BDP Quotation #: 032224 – 0745 RevB

BDP Industries, Inc. is pleased to offer our quotation for two (2) 4x10 Rotary Drum Thickeners and accessories. Below is a summary description of our proposed scope of supply.

EQUIPMENT DESCRIPTION

The RDT equipment package includes a complete rotary drum thickener and appurtenant equipment described as follows:

1. Two (2) Rotary Drum Thickeners with the following features:
 - a. 316L stainless steel tubular frame per ASTM A554-304 specification.
 - b. Polyurethane clear coat on the frame.
 - c. Machined bearing pads.
 - d. Four-foot diameter x 10-foot long variable speed drum.
 - e. 316 stainless steel wetted parts.
 - f. 316 stainless steel hardware.
 - g. Self-cleaning adjustable angle belt showers with Victaulic connections.
 - h. Valve and nozzle for adding water to discharge hopper.
 - i. Zero Speed switches for the drums.
 - j. Machine mounted Emergency Stop buttons.
 - k. TEFC, IP65 severe duty variable speed motors with temperature sensors.
 - l. PVC conduit.
 - m. NEMA 4X low voltage junction boxes.
 - n. Main incoming power 460/3/60
2. Two (2) Electrical Control Panel for thickening system control functions and drives.
 - a. NEMA 4X
 - b. 304 stainless steel
 - c. UL 508
 - d. HMI: Pushbuttons and VFD HIM on panel door.
 - e. VFD's: Allen Bradley Powerflex 525
 - f. 460/3/60
 - g. VFD for the RDT drive and Floc Tank drive. Motor starter for the washwater



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- booster pump.
- h. Motor starters for the RDT exhaust fans.
3. Two (2) 316 stainless steel polymer injection and polymer/sludge mixing system consisting of an injection ring, variable vortex mixer, and reducing fittings.
 4. Two (2) 316L stainless steel flocculation tank with 2.0 HP helical mixer.
 5. Two (2) Goulds wash water booster pump capable of boosting to 80 PSI at a flow rate of 18 GPM. The wash water system will include a low water pressure switch, electric actuating valve, wye strainer and pressure gauge.
 6. Two (2) 316L stainless steel thickened sludge discharge hopper with PMC pressure sensor for level control, and a flushing connection with manual ball valve assembly from the shower bar to the hopper.
 7. All start-up, mechanical checkout and operator training as specified. Service to include three (3) separate trips with nine (9) days of on-site services.
 8. Two (2) year equipment warranty, three-year warranty for the bearings, frame and frame coating.
 9. Freight to the job site.

The model RDT will come completely factory-assembled, tested and will be shipped in one piece. The polymer injection devices, sludge pumps, thickened sludge pumps, polymer systems, flowmeters, booster pumps, and electrical control panels will be packed separately for installation by others. This quotation is for furnishing equipment only and does not include any other installation labor or field services other than specified checkout, start up and testing services. All other installation, on-site assembly, anchorage, pads and other work required to facilitate the setting of the equipment is to be by others. All material and labor for interconnections between the RDT and other auxiliary equipment are to be completed by others.

ITEMS NOT INCLUDED IN THIS SCOPE OF SUPPLY

1. Unloading at the jobsite.
2. Installation.
3. Temporary or mobile thickening.
4. Operator platforms.
5. Polymer system.
6. Flow meter.
7. PLC.
8. OIT screen.
9. Sump grating.
10. Anchor bolts.
11. Sludge feed pump.
12. TWAS pump.
13. Applicable taxes of any kind.
14. Interconnecting plumbing and wiring.
15. Valves or instrumentation not listed above.



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SUBMITTAL DATA

Submittals will be made in the number of copies specified and will be available within 8 to 10 weeks after firm purchase order and all information is received at the factory.

SHIPMENT

Approximate shipping weight of the 4x10 RDT is 5,000 pounds. Estimated shipping time is 40 to 50 weeks after receipt of submittal approval.

FIELD SERVICE

Installation observation, testing and operator instruction services as specified will be supplied. Additional trips can be supplied at cost of \$1,400 per day plus travel expenses.

PRICING

The total price for the above equipment is **\$588,500.00** U.S. Dollars (\$). This price includes the shipping cost to the job site or nearest unloading point. The price does not include unloading cost and applicable taxes of any kind. This quotation will be valid through April 16, 2025.

TERMS

Terms of payment are 30% with purchase order, 60% upon shipment and 10% upon final acceptance. The attached Terms and Conditions are hereby made a part of this proposal.

We appreciate this opportunity to extend our quotation and if we can answer questions or supply additional information, please do not hesitate to contact Matt Streeter of EES at 515-450-8803.

Sincerely,

Dan Fronhofer, P.E.
BDP Industries, Inc.

cc: A.J. Schmidt, BDP Industries, Inc.
Matt Streeter, EES
(515) 450-8803
Mstreeter@e-equipmentsolutions.com

CONDITIONS OF SALE - COS 5-86

GENERAL -- This contract will exist between BDP Industries, Inc. (hereafter referred to as BDP) and the buyer only when accepted in writing by an officer of BDP. The prices quoted herein are firm for a period of 180 days if a contract is entered by April 16th, 2025. Any amendment to this contract must be in writing and acknowledged by both parties.

TERMS OF PAYMENT -- Payment is to be made on a net basis within thirty (30) days after invoice, subject to credit approval by BDP. The buyer's payment obligation is not dependent upon the buyer's receipt of payment from any other party. BDP reserves the right to invoice on partial shipments. Any balance owed by the buyer beyond thirty (30) days or more after due is subject to delinquency charges of 1.5% per month or any fraction thereof. This shall be in addition to any other amounts due and buyer shall reimburse BDP for all collection costs, including attorney's fees BDP may incur with respect to collection of past due amounts from the buyer.

TAXES -- This proposal does not include any Federal, State or Local Sales, Privilege, Use or any other taxes of any kind applicable to the sale of the equipment covered under this agreement. These taxes shall be paid by the buyer or the buyer shall provide BDP with a tax exemption certificate applicable to proper taxing authority.



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SHIPMENT -- All shipment will be F.O.B. factory. Shipping estimates contained herein are based on time of receipt at BDP's factory of all details pertaining to the order which are essential to contract completion.

FORCE MAJEURE -- BDP shall not be liable for any loss or damage of any nature whatsoever incurred or suffered as a result of any failures or delays in performance due to any cause or circumstances beyond its, or its subcontractors= or suppliers= control, including, but not by way of limitation, failure or delays in performance caused by strikes, lockouts or labor disputes, acts of purchaser, fires, acts of God or the public enemy, riots, incendiaries, interferences by civil or military authorities, compliance with the laws of the United States or with the orders or policies of any Governmental authority, delays in transit or delivery on the part of transportation companies or communication facilities or failure of sources of raw material. In the event of such delay, the time of delivery or completion shall be extended by a period of time equal to the period of delay plus such time as needed for start-up and/or remobilization, provided however, should the Force Majeure situation extend beyond six months the contract may be canceled by either party. Purchaser shall reimburse BDP for all costs and expenses including overhead costs which BDP may have reasonably incurred in terminating the contract, plus an amount as reasonable profits on that portions to the contract which has been completed.

WARRANTY -- BDP warrants the equipment manufactured by it to be free from defects in materials and workmanship for a period of 30 months from the date of shipment or 24 months from the date of start-up, whichever occurs first. BDP will repair or replace, at its option, F.O.B. its factory, any defective part or material, provided prompt notification is rendered in writing. The repair or replacement of items such as light bulbs, grease, oil, drive belts or chains, pump seals, etc. are not covered by this warranty and are considered normal consumption and routine maintenance items. In addition to the replacement of defective parts, BDP will also provide such labor as it deems necessary, to repair a defect in the main frame structure. BDP will not assume the cost of any modification or repair of its equipment unless it specifically gives authority for such action. **THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS. BDP MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR PARTICULAR PURPOSE OR MERCHANTABILITY.**

LIMITATION OF LIABILITY -- A. In no event, be it due to breach of any warranty hereunder or any other cause rising out of performance or non-performance of the obligations herein, whether any such breach or cause be or sound in tort, contract or otherwise, shall BDP be liable for indirect, special or consequential damages (such as, but not limited to, loss of profits, plant downtime, fines, penalties, or cost of replacement services) or sued by third parties against the purchaser (excluding suits regarding patents on title to the goods furnished hereunder). B. BDP's total cumulative liability for any and all reasons shall not exceed an amount equal to the contract price.

CLAIMS -- The buyer shall immediately inspect equipment within ten (10) days after receipt, BDP is not obligated to consider any claim for shortages or non-conformance unless notified by the buyer within ten (10) days after his receipt of the goods in question, BDP is not responsible for loss or damage in transit, however they will lend any possible assistance to the buyer in his pursuit of claim recovery.

CANCELLATION -- BDP will accept cancellation of this order upon receipt of payment for percentage of the contract equal to a percentage of the work completed. This shall be, at a minimum, 20% of the contract price.

STORAGE -- If the buyer delays shipment, then the buyer agrees to pay all invoices as they become due. The buyer further agrees to pay, in addition, storage charges computed at 1.5% per month of the invoice price of equipment stored.

PERMITS -- The buyer shall assume full cost and responsibility to obtain all permits or licenses with respect to the installation and operation of the equipment covered under this agreement. This shall include all requirements by Federal, State and Local governmental bodies.

OTHER -- This contract shall be governed in accordance with the laws of the State of New York. These conditions and terms are the only terms and conditions that will be binding upon the parties unless amended, and acknowledged, in writing by both parties. No assignment of this proposal or any purchase order resulting here from shall be binding on BDP unless accepted in writing by BDP.

**SECTION 01 2100
ALLOWANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cash allowances.

1.02 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts, less cost of delivery to site , less applicable taxes .
- B. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; and labor for installation and finishing. _____ .
- C. Engineer Responsibilities:
1. Consult with Contractor for consideration and selection of products, suppliers , and installers.
 2. Select products in consultation with Owner and transmit decision to Contractor.
 3. Prepare Change Order.
- D. Contractor Responsibilities:
1. Assist Engineer in selection of products, suppliers , and installers.
 2. Obtain proposals from suppliers and installers and offer recommendations.
 3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
 4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- E. Differences in costs will be adjusted by Change Order.

1.03 ALLOWANCES SCHEDULE

- A. Article _13.02_____ - _Allowances_____ : Include the stipulated sum of \$25,000 as a general allowance to account for any miscellaneous improvements that are found to be necessary after the construction work has proceeded. Allowance to be utilized only at the direction of the Owner and Engineer. .

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2100

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**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Comply with requirements specified in Section 01 3000.
- B. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
- D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
- E. Limit each request to a single proposed substitution item.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Submittal Time Restrictions:
 - 1. Instructions to Bidders specifies time restrictions and the documents required for submitting substitution requests during the bidding period.
- B. Submittal Form (before award of contract):

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):
 - 1. Submit substitution requests by completing CSI/CSC Form 13.1A - Substitution Request (After Bidding/Negotiating). See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Submit request for Substitution for Convenience within 14 days of discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Engineer, in order to stay on approved project schedule.
 - 1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
 - 2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
 - 3. Bear the costs engendered by proposed substitution of:

- a. Owner's compensation to the Engineer for any required redesign, time spent processing and evaluating the request.
- C. Substitutions will not be considered under one or more of the following circumstances:
 - 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.

3.04 NOT USED

3.05 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

END OF SECTION 01 2500

**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electronic document submittal service.
- B. Preconstruction Meeting.
- C. Progress Meetings.
- D. Submittals for Review, Information, and Project Closeout.
- E. Number of Copies of Submittals.
- F. Submittal Procedures.

1.02 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions.
- B. Document 00800 - Supplementary General Conditions.
- C. Section 01 1000 - Summary.
- D. Section 01 3216 - CONSTRUCTION PROGRESS SCHEDULE
- E. Section 01 7000 - Execution and Closeout Requirements.
- F. Section 01 7800 - Closeout Submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
 - 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 - 2. Contractor and Engineer are required to use this service.
 - 3. It is Contractor's responsibility to submit documents in allowable format.
 - 4. Subcontractors, suppliers, and Engineer's consultants are to be permitted to use the service at no extra charge.
 - 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
 - 6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
 - 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Submittal Service: Use one of the following:
 - 1. Submittal Exchange (tel: 1-800-714-0024): www.submittalexchange.com/#sle.
 - 2. Procore (tel: 1-844-682-1707): www.procore.com/#sle.
- C. Project Closeout: Engineer will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 CONSTRUCTION SURVEY

- A. Contractor to provide construction staking and survey.
- B. Contractor to locate and protect survey control and reference points.
- C. Control datum for survey is that established by Owner provided survey.
- D. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

3.03 PRECONSTRUCTION MEETING

- A. Engineer will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. Engineer.
 - 3. Resident Project Representative
 - 4. Contractor.
 - 5. Contractor's Superintendent.
 - 6. Major Subcontractors.
 - 7. Utility Companies.
- C. Agenda:
 - 1. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
 - 2. Designation of personnel representing the parties to Contract, Owner, Contractor, and Engineer.
 - 3. List and schedule of submittals/shop drawings.
 - 4. Designation of personnel representing the parties in Contract and the Engineer.
 - 5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, Requests for Information, and Contract closeout procedures.
 - 6. Use of premises by Owner and Contractor.
 - 7. Owner's requirements.
 - 8. Facilities and controls provided by Owner.
 - 9. Temporary utilities provided by Owner.
 - 10. Security and housekeeping procedures.
 - 11. Scheduling.
 - 12. Procedures for testing.
 - 13. Procedures for maintaining record documents.
- D. Engineer shall record minutes and distribute electronic copies to participants and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Contractor to schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Contractor to make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two days to Engineer, Owner, participants, and those affected by decisions made.
- C. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. Engineer.
 - 4. Contractor's superintendent.
 - 5. Major subcontractors.

D. Agenda:

1. Review minutes of previous meetings.
2. Address public concerns and complaints.
3. Review of work progress.
4. Field observations, problems, and decisions.
5. Identification of problems that impede, or will impede, planned progress.
6. Review of submittals schedule and status of submittals.
7. Review of RFIs log and status of responses.
8. Review of off-site fabrication and delivery schedules.
9. Maintenance of progress schedule.
10. Corrective measures to regain projected schedules.
11. Planned progress during succeeding work period.
12. Coordination of projected progress.
13. Maintenance of quality and work standards.
14. Effect of proposed changes on progress schedule and coordination.
15. Other business relating to work.
16. Schedule next meeting.

- E. Contractor shall Record minutes and distribute copies within two days after meeting to participants, with two copies to Engineer, Owner, participants, and those affected by decisions made.

3.05 CHECK-IN MEETINGS

- A. Contractor to schedule and administer weekly check-in meetings via remote platform such as Microsoft Teams. Check-in meeting to be abridged version of Progress Meetings. Frequency of check-in meetings to be adjusted based on construction activity and at discretion of the Owner.

3.06 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
1. Product data.
 2. Design data.
 3. Shop drawings.
 4. Samples for selection.
 5. Samples for verification.
- B. Submit for review according to the procedures and purposes described herein.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.
- E. Required Submittal Quality
1. Organization
 - a. Cover Labeling
 - 1) Supplier name, address, and telephone number.
 - 2) Supplier's designated Project Number.
 - 3) Engineer's designated Project Name, Job Number, and Location.
 - 4) Engineer's firm name and location
 - 5) General contractors name and location
 - 6) Specification Section(s) applicable to submittal contents.
 - b. Contents
 - 1) Cover sheet (same as Exterior Cover requirements) with at least a 4" x 4" blank space for Engineers Review Stamp.
 - 2) Table of Contents for all major equipment/devices/components/descriptions specified.
 - 3) Notification of all exceptions taken to the specifications.

- 4) Order of Contents -- must be the same as order described in the applicable specification sections.
 - 5) Tabs separating each major equipment division.
2. Identification of Pertinent Information
 - a. Provide Bill of Materials to indicate (at minimum) series, model number, and manufacturer.
 - b. On catalog cut sheets:
 - 1) Identify series and complete model number proposed.
 - 2) Identify information pertinent to proposed model and conformance to specifications by arrow, underline, circular enclosure.
 - 3) Minimize non-specific information that does not indicate conformance or cross out non-pertinent information.
 - c. On performance data/curves etc. clearly identify pertinent information (or cross out non-pertinent) data.
 - d. On all documentation provided, illustrate exceptions to the contract documents.
3. Legible Quality
 - a. Font size no less than 10; minimum character height no less than 1/16".
 - b. No faxes accepted.
 - c. No copies of catalog cuts accepted where information is skewed off page or non-linear.
 - d. Basic information to be all typewritten; only identification of pertinent information may be hand written.

3.07 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 1. Design data.
 2. Certificates.
 3. Test reports.
 4. Inspection reports.
 5. Manufacturer's instructions.
 6. Manufacturer's field reports.
 7. Other types indicated.
- B. Submit for Engineer's knowledge as contract administrator or for Owner.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit Correction Punch List for Substantial Completion.
- B. Submit Final Correction Punch List for Substantial Completion.
- C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
 1. Project record documents.
 2. Operation and maintenance data.
 3. Warranties.
 4. Bonds.
 5. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Documents for Review:
 1. Submit the number of copies which the Contractor requires, plus copies which will be retained by the Engineer.
 2. Include an electronic copy with all paper submittals

- C. Documents for Information: Submit one copy.
- D. Documents for Project Closeout: Make one reproduction of submittal originally reviewed.

3.10 SUBMITTAL PROCEDURES

- A. General Requirements:
- B. Shop Drawing Procedures:
 - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 - 2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- C. Transmit each submittal with approved form.
- D. Submittal number shall be in reference to Engineer's specification section. If there are multiple submittals to a singular specification section add a hyphen followed by a number. Re-submittals to have original number with an alphabetic suffix.
 - 1. Examples:
 - a. Two submittals (from same specification section) for Project Review: 16 4250-1 & 16 4250-2; second submittal (after initial review was rejected): 16 4250-2-A.
- E. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- F. Apply Contractor's standard certification stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents. Submittals without this certification will be returned without review.
- G. Electronic Submittal Procedure
 - 1. Summary:
 - a. Shop drawing and product data submittals shall be transmitted to Engineer in electronic (PDF) format via FTP site or email.
 - b. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
 - c. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
 - d. Electronic submittals shall have bookmarks created in the navigation frame for each major entry ("Section" or "Chapter") in the Table of Contents. Electronic submittals without bookmarks will be rejected.
 - 2. Procedures:
 - a. Submittal Preparation - Contractor may use any or all of the following options:
 - 1) Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via the Submittal Exchange or Procore website.
 - 2) Subcontractors and Suppliers provide paper submittals to General Contractor who electronically scans and converts to PDF format.
 - 3) Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
 - b. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
 - c. Contractor shall transmit each submittal to Engineer using the Submittal Exchange website, www.submittalexchange.com or Procore website, www.procore.com.
 - d. Engineer review comments will be made available on the Submittal Exchange website or Procore website for downloading. Contractor will receive email notice of completed review.

- e. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
- f. Submit paper copies of reviewed submittals at project closeout for record purposes in accordance with Section 017800 - Closeout Submittals
- 3. Costs:
 - a. General Contractor shall include the full cost of Submittal Exchange or Procore project subscription in their proposal. This cost is included in the Contract Amount. Contact Submittal Exchange at 1-800-714-0024 to verify cost prior to bid. Contact Procore at (844) 682-1707 to verify cost prior to bid.
 - b. At Contractor's option, training is available from Submittal Exchange or Procore regarding use of website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024 or contact Procore at (844) 682-1707 to verify cost prior to bid.
 - c. Internet Service and Equipment Requirements:
 - 1) Email address and Internet access at Contractor's main office.
 - 2) Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or other similar PDF review software for applying electronic stamps and comments.
- H. Schedule submittals to expedite the Project, and deliver. Coordinate submission of related items.
- I. Coordinate submittals with other submittals, related activities, sequential activities and overall performance of the Work.
- J. Revise and submit submittals as required, identify all changes made since previous submittal.
- K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.
- L. Clearly identify on the transmittal sheet if the submittal represents "Or Equal" items or substitute items. If the submittal is a substitute, the substitution must result in a decrease in overall cost or result in saving construction time.
- M. Contractor to investigate and evaluate for items with long lead times or critical path to execution of the contract, and to coordinate at least these items' submittal groupings with the Engineer. The Engineer accepts no burden for project delays where additional submittal cycles are required to ascertain conformance and intent to the contract documents.
- N. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, give written notice thereof at least 7 calendar days prior to release for manufacture.
- O. When the shop drawings have been completed to the satisfaction of the Engineer, carry out the construction in accordance therewith and make no further changes therein except upon written instructions from the Engineer.

3.11 ENGINEER'S REVIEW RESPONSIBILITIES, PROCEDURES AND DEFINITIONS

- A. General
 - 1. Review of shop drawings, data, and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:
 - a. As permitting any departure from the Contract requirements;
 - b. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
 - c. As approving departures from details furnished by the Engineer, except as otherwise provided herein;
 - d. As approving substitutions to specified products or manufacturers.
 - 2. The Engineer does not review for verification of quantities, weights, dimensions, or means and methods.
 - 3. Partial review status will not be given to a submittal. Entire submittal shall be either acceptable or the entire submittal must be resubmitted with corrections as clarified by status definitions below.

4. Submittals will be reviewed in order received unless Contractor requests a revised order of review, in writing. All submittals shall be submitted sufficiently in advance of construction requirements to provide no less than 21 calendar days for review from the time the Engineer receives them. No less than 30 calendar days will be required for major equipment that requires review by more than one engineering discipline.
- B. All submittals that have been reviewed by Engineer will have Engineer's Review Stamp affixed, initialed and dated, indicating Engineer's review action. No submittals shall be used for construction unless they bear the initialed Engineer's Review Stamp. Possible review actions by Engineer are:
 1. NO EXCEPTIONS NOTED. Engineer's review did not detect deviations from conformance and intent of the Contract Documents.
 2. EXCEPTIONS NOTED. Engineer's review did not detect major deviations from conformance and intent of the contract documents; minor discrepancies and/or deficiencies are noted. Corrected copies are not required; however, the item(s) to be furnished are to be furnished in accordance with the Engineer's comments. If the Contractor elects to take exception to any comments, then corrected copies (with supplemental explanatory data) are to be re-submitted to the Engineer similar to a Revise and Resubmit status process.
 3. REVISE AND RESUBMIT. Engineer's review found major discrepancies and/or deficiencies, and corrected submittals (in their entirety) are required to determine conformance and intent to the contract documents.
 4. REJECTED. Engineer's review concluded that the item(s) submitted do not meet the requirements of the "Or Equal" allowance, or a "Substitution" has been provided without proper approval process. An additional submittal cycle is required containing suitable items to determine conformance and intent of the contract documents.
 5. REVIEW NOT REQUIRED BY CONTRACT DOCUMENTS -- The Engineer's review found that the information submitted is not necessary to evaluate conformance and intent with contract documents.

3.12 RE-SUBMITTALS

- A. Re-submittals will be handled in the same manner as first submittals. On re-submittals, direct specific attention, in writing on the transmittal letter and on re-submitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Engineer, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. Make corrections to any work done because of this type revision that is not in accordance to the Contract Documents as may be required by the Engineer.
- B. Engineer will review all initial information for each submittal. Contractor shall reimburse Owner for the Engineer's charges for review of additional re-submittals. Contractor will be charged for review of all re-submittals over 20% of the initial submittals.
 1. EXAMPLE: If the Contractor has a total of 50 initial submittals, there will be no charge for reviewing a combined total of 60 submittals and re-submittals. There will be a charge to review all submittals and re-submittals in excess of 60.
- C. The need for more than one re-submittal or any other delay in obtaining Engineer's review of submittals, will not entitle Contractor to extension of the contract time unless delay of the Work is the direct result of a change in the Work authorized by a Change Order or failure of Engineer to review and return any submittal to Contractor within the specified review period.
- D. An assigned review status of REVISE AND RESUBMIT or REJECTED requires the original full number of submittals to be resubmitted free of the Engineers previous correction marks and review status stamp. The Engineer reserves the right to retain the same number of copies for each review cycle.

END OF SECTION 01 3000

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**SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Preliminary schedule.
- C. Construction progress schedule, bar chart type.

1.02 SUBMITTALS

- A. Within 15 days after date of Agreement, submit initial progress schedule in duplicate defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. Revise and resubmit as required.
- C. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- D. Submit revised schedule with each Application for Payment, identifying changes since previous version.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates.

1.03 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. The Project Schedule shall show the sequence in which the Contractor proposes to perform the Work, indicate the Critical Path, identify the dates on which the Contractor proposes to start and finish the scheduled activities of the Contract Work, indicate Substantial Completion within the Contract Time, indicate a date for Final Acceptance, and meet all the requirements as may be set forth in the Contract Documents.
- E. Provide sub-schedules to define critical portions of the entire schedule.
- F. Include conferences and meetings in schedule.
- G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- H. Coordinate content with Schedule of Prices specified in the Proposal.
- I. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Resident Project Representative at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Update diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.

3.06 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Engineer, Resident Project Representative, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION 01 3216

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Field Samples.
- B. References and Standards.
- C. Control of Installation.
- D. Testing Services.
- E. Control of installation.
- F. Tolerances.
- G. Manufacturers' Field Services.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - ADMINISTRATIVE REQUIREMENTS: Submittal procedures.

1.03 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving bids or date of Owner-Contractor Agreement when there are no bids.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.04 FIELD SAMPLES

- A. Install field samples at the site as required by individual specifications Sections for review.
- B. Acceptable samples represent a quality level for the Work.
- C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Engineer.

1.05 TESTING SERVICES

- A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.
- B. Owner may choose to have Engineer perform certain inspection and testing activities in addition to those specified as required by the Contractor. Payment for initial Owner/Engineer inspection and testing will be by Owner. Payment for Owner/Engineer retesting required because of non-conformance to specified requirements will be charged to the Contractor by deducting inspection and testing charges from the Contract Sum.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING AND INSPECTION

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
 - 2. Perform inspections, sampling, testing, and other services specified in individual specification sections and as required by the Engineer.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Engineer and Contractor of observed irregularities or non-compliance of Work or products.
 - 5. Perform additional tests and inspections required by Engineer.
 - 6. Submit reports of all tests/inspections specified to Engineer, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs, equipment, tools, storage, and assistance as requested.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.

3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Make arrangements with testing agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Engineer. Payment for re-testing will be made by the Contractor.

3.04 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given by Manufacturer's Service Representatives to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report in duplicate within 30 days of observation to Engineer for review.
- D. Contractor shall provide qualified Service Representative(s), as necessary to:
 1. Instruct the Contractor's personnel in the installation, startup, and testing of equipment.
 2. Inspect equipment after it is installed to assure that all details of installation are correct and that equipment is prepared for operation in accordance with manufacturer's instructions and recommendations.
 3. Check connections to equipment and adjust, or supervise adjustment of, control and indicating devices after equipment has been installed and connected.
 4. Fully instruct Owner's operating personnel in operation and maintenance of equipment.
 5. Provide Engineer with duplicate copies of final alignment and clearance measurements on all rotating or reciprocating equipment. Measurements shall clearly identify each piece of equipment.
 6. Supervise preliminary operation of equipment and necessary adjustments.
- E. Presence of Service Representative will in no way relieve Contractor of any responsibility assumed under Agreement.
- F. Work and abilities of Service Representative shall be subject to review of Engineer. If Engineer determines that any Service Representative is not properly qualified, Contractor shall replace Service Representative upon written notification by Engineer.
- G. Contractor shall provide continuity in assignment of Service Representative to Work. In event substitution of Service Representative is made which is not at request of Engineer, substitute's time for "familiarization" shall be at Contractor's expense.
- H. Execute manufacturer's certificate of proper installation, found at the end of this section.

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER: _____ EQPT. SERIAL NO: _____
EQPT. TAG NO.: _____ EQPT./SYSTEM: _____
PROJECT NO.: _____ SPEC. SECTION: _____

**I HEREBY CERTIFY THAT THE ABOVE-REFERENCED EQUIPMENT/SYSTEM HAS BEEN:
(CHECK APPLICABLE)**

- ☐ Installed in accordance with Manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer.)

COMMENTS: _____

I, THE UNDERSIGNED MANUFACTURER'S REPRESENTATIVE, HEREBY CERTIFY THAT I AM (I) A DULY AUTHORIZED REPRESENTATIVE OF THE MANUFACTURER, (II) EMPOWERED BY THE MANUFACTURER TO INSPECT, APPROVE, AND OPERATE HIS EQUIPMENT AND (III) AUTHORIZED TO MAKE RECOMMENDATIONS REQUIRED TO ASSURE THAT THE EQUIPMENT FURNISHED BY THE MANUFACTURER IS COMPLETE AND OPERATIONAL, EXCEPT AS MAY BE OTHERWISE INDICATED HEREIN. I FURTHER CERTIFY THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND ACCURATE.

DATE: _____
MANUFACTURER: _____
BY MANUFACTURER'S AUTHORIZED REPRESENTATIVE: _____

(Authorized Signature)

END OF SECTION 01 4000

**SECTION 01 4213
ABBREVIATIONS**

PART 1 GENERAL

1.01 GENERAL

- A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations which may appear in these Specifications shall have the meanings indicated herein.

1.02 ABBREVIATION

- A. AAMA - Architectural Aluminum Manufacturer's Association
- B. AASHTO - American Association of State Highway and Transportation Officials
- C. AATCC - American Association of Textile Chemists and Colorists
- D. ACI - American Concrete Institute
- E. AFBMA - Anti-Friction Bearing Manufacturer's Association, Inc.
- F. AGA - American Gas Association
- G. AGMA - American Gear Manufacturer's Association
- H. AI - The Asphalt Institute
- I. AIA - American Institute of Architects
- J. AISC - American Institute of Steel Construction
- K. AISI - American Iron and Steel Institute
- L. AITC - American Institute of Timber Construction
- M. AMCA - Air Moving and Conditioning Association
- N. ANS - American Nuclear Society
- O. ANSI - American National Standards Institute, Inc.
- P. APA - American Plywood Association
- Q. API - American Petroleum Institute
- R. APWA - American Public Works Association
- S. ASA - Acoustical Society of America
- T. ASAE - American Society of Agricultural Engineers
- U. ASCE - American Society of Civil Engineers
- V. ASHRAE - American Society of Heating, Refrigerating, and Air Conditioning Engineers
- W. ASME - American Society of Mechanical Engineers
- X. ASQC - American Society for Quality Control
- Y. ASSE - American Society of Sanitary Engineers
- Z. ASTM - American Society for Testing and Materials
- AA. AWWA - American Water Works Association
- BB. AWPI - American Wood Preservers Institute
- CC. AWS - American Welding Society
- DD. AWWA - American Water Works Association
- EE. BHMA - Builders Hardware Manufacturer's Association

FF. CBM - Certified Ballast Manufacturers
GG. CEMA - Conveyors Equipment Manufacturer's Association
HH. CGA - Compressed Gas Association
II. CMA - Concrete Masonry Association
JJ. CRSI - Concrete Reinforcing Steel Institute
KK. EIA - Electronic Industries Association
LL. ETL - Electrical Test Laboratories
MM. EPA - Environmental Protection Agency
NN. FM - Factory Mutual System
OO. FPL - Forest Products Laboratory
PP. HI - Hydraulics Institute
QQ. IAPMO - International Association of Plumbing and Mechanical Officials
RR. ICBO - International Conference of Building Officials
SS. IEEE - Institute of Electrical and Electronics Engineers
TT. IES - Illuminating Engineering Society
UU. IME - Institute of Makers of Explosives
VV. IP - Institute of Petroleum (London)
WW. IPC - Institute of Printed Circuits
XX. ISA - Instrument Society of America
YY. ISO - International Organization for Standardization
ZZ. ITE - Institute of Traffic Engineers
AAA. MBMA - Metal Building Manufacturer's Association
BBB. MPTA - Mechanical Power Transmission Association
CCC. MSS - Manufacturing Standardization Society
DDD. NAAMM - National Association of Architectural Metal Manufacturer's
EEE. NACE - National Association of Corrosion Engineers
FFF. NBS - National Bureau of Standards
GGG. NEC - National Electrical Code
HHH. NEMA - National Electrical Manufacturer's Association
III. NFPA - National Fire Protection Association
JJJ. NFPA - National Forest Products Association
KKK. NLGI - National Lubricating Grease Institute
LLL. NMA - National Microfilm Association
MMM. NSF - National Sanitation Foundation
NNN. NWMA - National Woodwork Manufacturers Association
OOO. OSHA - Occupational Safety and Health Administration
PPP. PCA - Portland Cement Association
QQQ. PPI - Plastics Pipe Institute
RRR. RCRA - Resource Conservation and Recovery Act
SSS. RVIA - Recreational Vehicle Industry Association

TTT.	RWMA - Resistance Welder Manufacturer's Association
UUU.	SAE - Society of Automotive Engineers
VVV.	SAMA - Scientific Apparatus Makers Association
WWW.	SMA - Screen Manufacturers Association
XXX.	SMACCNA - Sheet Metal and Air Conditioning Contractors National Association
YYY.	SPI - Society of the Plastics Industry, Inc.
ZZZ.	SPIB - Southern Pine Inspection Bureau
AAAA.	SPR - Simplified Practice Recommendation
BBBB.	SSPC - Steel Structures Painting Council
CCCC.	SSPWC - Standard Specifications for Public Works Construction
DDDD.	UL - Underwriters Laboratories, Inc.
EEEE.	WCLIB - West Coast Lumber Inspection Bureau
FFFF.	WCRSI - Western Concrete Reinforcing Steel Institute
GGGG.	WEF - Water Environment Federation
HHHH.	WIC - Woodwork Institute of California
IIII.	WRI - Wire Reinforcement Institute, Inc.
JJJJ.	WWPA - Western Wood Products Association

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 4213

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**SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities.
- B. Temporary Heat.
- C. Temporary telecommunications services.
- D. Temporary Water Service.
- E. Temporary Sanitary Facilities.
- F. Water Control.
- G. Protection of Installed Work.
- H. Security Requirements.
- I. Vehicular Access and Parking.
- J. Waste Removal.

1.02 TEMPORARY UTILITIES

- A. Contractor shall provide and pay for all electrical power required for construction purposes, including field offices.

1.03 TEMPORARY HEAT

- A. Contractor shall provide and pay for heat devices and heat as required to maintain specified conditions for construction operations.

1.04 TEMPORARY TELEPHONE SERVICE

- A. Provide, maintain, and pay for mobile phone service for the field superintendent or other Contractor field representative.
- B. A cellular phone shall be acceptable as temporary phone service. Provide phone number to Engineer and Owner.

1.05 TEMPORARY WATER SERVICE

- A. Make suitable arrangements for temporary water service if water is needed for construction or testing. There will be no cost to the Contractor for water used.

1.06 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures for Contractor's workers, Engineer's personnel, Owner's personnel and testing firm personnel working at project site. Provide at time of project mobilization.
- B. Use of existing facilities is not permitted.
- C. Portable toilets shall be acceptable. Comply with all applicable codes and regulations. Arrange for regular cleaning and/or replacement of portable toilets.
- D. Maintain daily in clean and sanitary condition.
- E. At end of construction, return facilities to same or better condition as originally found.

1.07 WATER CONTROL

- A. Conform to the regulations and requirements of legally authorized surface water management agencies.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Conduct operations in such a manner to prevent sediment from reaching existing sewers and storm drains.

- D. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- E. Cover exposed excavated areas and spoil piles when runoff from rain is likely to cause turbidity to enter local waterways. Suspend work in the rain if such work cannot be performed without causing turbid runoff.
- F. Prevent solids or turbid runoff from entering local waterways. Cover, secure and /or berm excavated area and spoil piles.
- G. Where necessary, divert stream through closed pipe system to minimize downstream erosion, sedimentation, and turbidity during construction.

1.08 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification Sections.

1.09 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.10 VEHICULAR ACCESS AND PARKING

- A. Maintain existing roads.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
- D. Provide and maintain access to fire hydrants, free of obstructions.
- E. Provide means of removing mud from vehicle wheels before entering streets.
- F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 5000

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Warranty.
- B. Re-use of Existing Products.
- C. Product Option Requirements.
- D. Substitution Limitations and Procedures.
- E. Procedures for Owner-Supplied Products.
- F. Transportation, Handling, Storage and Protection.
- G. Spare Parts and Maintenance Materials.

1.02 WARRANTY

- A. All Products as defined below shall be provided with manufacturer's full warranty against defects in materials and workmanship for two years after Date of Substantial Completion, including all parts, labor, and expenses, unless otherwise required in individual specification Sections.
 - 1. This manufacturer's warranty shall be in addition to the Contractor's guarantee secured by the Performance and Maintenance Bond - Section 00610.

PART 2 PRODUCTS

2.01 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- C. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:
 - 1. Made of wood from newly cut old growth timber.
 - 2. Containing lead, cadmium, or asbestos.
- C. Where other criteria are met, Contractor shall give preference to products that:
 - 1. If used on interior, have lower emissions.
 - 2. If wet-applied, have lower VOC content.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.
- B. A request for substitution constitutes a representation that the submitter:
 - 1. Will reimburse Owner for review or redesign services associated with re-approval by authorities.

3.02 OWNER-SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
 - 1. Contractor shall be paid for materials and equipment stored off-site, upon proper documentation of delivery, control and protection of said materials and equipment. Contractor's insurance shall be in full force at this off-site location for complete protection of said materials and equipment.
- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- K. Prevent contact with material that may cause corrosion, discoloration, or staining.
- L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 6000

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**SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Coordination
- C. Examination, Preparation, and General Installation Procedures.
- D. Requirements for alterations work, including selective demolition.
- E. Cutting and Patching.
- F. Alterations.
- G. Laying Out the Work.
- H. Starting Systems.
- I. Demonstration and Instruction.
- J. Closeout Procedures.

1.02 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather-exposed or moisture-resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.

1.03 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Minimize dust nuisance by cleaning, sweeping, vacuum sweeping, sprinkling with water, or other means. The use of water in amounts that result in mud on public streets or roads is not an acceptable substitute for sweeping. Equipment for this operation shall be available at all times.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as silt fences, filter fabric, sedimentation ponds, placement berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

1. Restrict construction involving noisy operations, including starting and warming up of equipment, to the hours between 7:00 a.m. and 8:00 p.m. on weekdays.
2. Each internal combustion engine, used for any purpose on the job or related to the job, shall be enclosed and be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without muffler and enclosure.

1.04 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. Coordinate completion and clean-up of work of separate sections.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections and as identified on Contract Drawings; match existing products and work for patching and extending work.

PART 3 EXECUTION

3.01 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Contractor shall locate and protect survey control and reference points.
- C. Control datum for survey is that established by Owner provided survey.
- D. Utilize recognized engineering survey practices.
- E. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- C. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- D. Materials: As specified in product Section; match existing products and work for patching and extending work.
- E. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- F. Remove, cut, and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition.
- G. Make neat transitions between different surfaces, maintaining texture and appearance.

3.03 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Engineer before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
 - 2. Relocate items indicated on drawings.
 - 3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- C. Services (Including but not limited to HVAC, Plumbing, and Electrical): Remove, relocate, and extend existing systems to accommodate new construction.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 - 4. Verify that abandoned services serve only abandoned facilities.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- D. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.
- E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
- F. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Engineer.
- G. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Engineer review and request instructions.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
 - 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.

- 2. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- J. Finish surfaces as specified in individual product Sections.
- K. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
 - 1. Patch as specified for patching new work.
- L. Clean existing systems and equipment.
- M. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- N. Do not begin new construction in alterations areas before demolition is complete.
- O. Comply with all other applicable requirements of this section.

3.04 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove samples of installed work for testing when requested.
 - 8. Remove and replace defective and non-complying work.
- D. Execute cutting, fitting, and patching, including excavation and fill, to complete Work, and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- J. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- K. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

- L. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- M. Identify any hazardous substance or condition exposed during the Work to the Engineer for decision or remedy.

3.05 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer and Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01 4000 that equipment or system has been properly installed and is functioning correctly.
- I. Perform subsequent testing, adjusting, and balancing of equipment and systems as required to provide operation according to the manufacturer's recommendations and the Contract Documents.

3.06 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at designated location.
- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.07 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- D. Clean site; sweep paved areas, rake clean landscaped surfaces.
- E. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.08 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Engineer.
- B. Notify Engineer when work is considered ready for Final Completion.

- C. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- E. Submit Contractor's Statement listing all Iowa sales/use taxes, waivers of liens from all Subcontractors and suppliers, and other items required by the Contract Documents.
- F. Conduct Substantial Completion inspection and create Final Correction Punch List containing Engineer's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Engineer.
- G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- H. Notify Engineer when work is considered finally complete and ready for Engineer's Substantial Completion final inspection.
- I. Complete items of work determined by Engineer listed in executed Certificate of Substantial Completion.

END OF SECTION 01 7000

**SECTION 01 7413
CLEANING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cleaning during progress and at the completion of the Work as required by General Conditions.

1.02 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

1.03 RESPONSIBILITIES AND COORDINATION BETWEEN PRIME CONTRACTORS

- A. Contractor is responsible for cleaning their own installed materials and equipment, both during and at the completion of construction. Each Contractor is responsible for removing and disposing waste, rubbish, and debris off the site in an approved landfill area.
- B. If Contractor fails to clean exposed surfaces and/or remove debris from site, the Owner may clean up and charge the cost to the Contractor responsible as the Owner determines to be just.
- C. Contractor is responsible for final cleaning of floors, walks, and grounds.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Contractor to provide all equipment required to complete cleaning.
- B. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- C. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- D. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.
- B. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal disposal areas away from the site.
- C. After painting begins or permanent heating system is started, use vacuum cleaning in lieu of broom cleaning methods.

3.02 FINAL CLEANING

- A. In addition to the requirements for clean-up as specified in the General Conditions, the Contractor shall remove to the Owner's satisfaction, all asphalt or concrete spilled on or around the buildings. Dispose of all rubbish and debris from the site in an approved landfill area.
- B. Employ skilled workmen for final cleaning.
- C. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- D. Wash and shine glazing and mirrors.
- E. Polish glossy surfaces to a clear shine.
- F. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- G. Prior to final completion, or Owner occupancy, the Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas to verify that the entire work is clean.

END OF SECTION 01 7413

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Operation and maintenance data.
- C. Instruction of Owner's Personnel.
- D. Warranties and Bonds.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - ADMINISTRATIVE REQUIREMENTS: Submittals procedures, shop drawings, product data, and samples.
- B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- C. Individual Product Sections: Specific requirements for operation and maintenance data.
- D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Operation and Maintenance Data:
 - 1. Submit two (2) copies of preliminary draft hard copies (paper) or proposed formats and outlines of contents before start of Work. Submit one (1) copy of preliminary electronic format before start of work. Engineer will review draft and return one copy with comments.
 - 2. Submit three copies of approved data in final form prior to final inspection or acceptance.
- B. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
- B. Store record documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish main floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

- 4. Field changes of dimension and detail.
- 5. Details not on original Contract drawings.
- E. Submit documents to Engineer prior to claim for final Application for Payment.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data for particular installation. Organize in consistent format under separate headings for different procedures. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- E. Copy of each warranty, Bond, and service contract issued. Provide information sheet for Owner's personnel, giving proper procedures in event of failure and instances which might affect validity of warranties or Bonds.

3.03 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems.
- B. Manual for equipment and systems shall constitute basis of instruction. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.
- C. Any presentation or training materials shall be provided to the Owner in format presented (i.e. Microsoft format, Office 365 or less).

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- E. Provide servicing and lubrication schedule, and list of lubricants required.
- F. Include manufacturer's printed operation and maintenance instructions.
- G. Include sequence of operation by controls manufacturer.
- H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance. Include predicted life of parts subject to wear and list of items recommended to be stocked as spare parts.

- I. Provide control diagrams by controls manufacturer as installed.
- J. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- K. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- L. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- M. Content for each electrical and electronic system, as appropriate.
 - 1. Description of system and component parts:
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, and tests.
 - c. Complete nomenclature and commercial number of replacement parts.
 - 2. Circuit directories of panel boards:
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 - 3. As-installed color coded wiring diagrams.
 - 4. Operating procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
 - 5. Maintenance procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting".
 - c. Disassembly, repair, and assembly.
 - d. Adjustment and checking.
 - 6. Manufacturer's printed operating and maintenance instructions.
 - 7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- N. Prepare and include additional data when need for such data becomes apparent during instruction of Owner's personnel.
- O. Additional Requirements: As specified in individual product specification sections.

3.05 OPERATION AND MAINTENANCE MANUALS (HARD COPIES - PAPER)

- A. Prepare instructions and data by personnel:
 - 1. Trained and experienced in maintenance and operation of described products.
 - 2. Familiar with requirements of this section.
 - 3. Skilled as technical writers to extent required to communicate essential data.
 - 4. Skilled as draftsmen competent to prepare required drawings.
- B. Prepare data in the form of an instructional manual for use by Owner's personnel.
- C. Format: 8-1/2 x 11 inch paper with 20 lb. minimum, white, for typed pages.
- D. Binders: Commercial quality, 8-1/2 by 11 inch binders with durable and cleanable plastic covers; 3 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
 - 1. Label spine of binder with identity of general subject matter covered in manual.
- E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify: title of Project, identity of separate structure as applicable, and identity of general subject matter covered in manual.

- F. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Contents: Neatly typewritten table of contents for each volume, arranged in systematic order with consecutive page numbers.
 - 1. Contractor, name of responsible principal, address, and telephone number.
 - 2. List of each product required to be included, indexed to content of volume.
 - 3. List, with each product, name, address, and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Identify area of responsibility of each.
 - d. Local source of supply for parts and replacement and list of recommended spare parts.
 - 4. Identify each product by product name and other identifying symbols as set forth in Contract documents, including nameplate information and shop order numbers for each item of equipment furnished.
 - 5. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
 - 6. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.

3.06 OPERATION AND MAINTENANCE MANUALS (ELECTRONIC)

- A. Prepare instructions and data by personnel:
 - 1. Trained and experienced in maintenance and operation of described products.
 - 2. Familiar with requirements of this section.
 - 3. Skilled as technical writers to extent required to communicate essential data.
 - 4. Skilled as draftsmen competent to prepare required drawings.
- B. Prepare data in the form of an instructional manual for use by Owner's personnel.
- C. Format: Electronic copy shall be delivered on a unique CD-ROM in Adobe Acrobat's Portable Document Format (PDF) and Microsoft Word versions. The PDF file(s) shall be bookmarked, fully indexed using the table of contents, searchable with thumbnails generated. The Microsoft Word files shall be easily found using unique file naming conventions with reference list.
- D. Cover: Identify each CD-ROM with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify: title of Project, identity of separate structure as applicable, and identity of general subject matter covered in manual.
 - 1. Contents: Neatly typewritten table of contents for each volume, arranged in systematic order.
 - 2. List of each product required to be included, indexed to content of volume.
 - 3. List, with each product, name, address, and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Identify area of responsibility of each.
 - d. Local source of supply for parts and replacement and list of recommended spare parts.
 - 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents, including nameplate information and shop order numbers for each item of equipment furnished.

3.07 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Completion is determined.

- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

END OF SECTION 01 7800

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SECTION 02 4100 DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. The Contractor shall furnish all supervised labor, materials, equipment, studies, and incidentals required for the demolition and modification of existing facilities as identified in the Contract Drawings as outlined below:
 - 1. Selective demolition of existing equipment, piping, mechanical equipment, electrical equipment and miscellaneous appurtenances encountered during construction operations.
 - 2. Temporary modification of structures, equipment, appurtenances and utilities as necessary to allow for operation of the facilities during construction.
 - 3. Provisions and legal procedures for proper disposal of any existing wastewater and/or debris in the facilities or associated piping as part of the demolition process.
- B. This section may not cover all of the activities necessary to perform the Work. The Contractor shall exercise due concern for the utility system operation and shall direct all of the Contractor's activities toward maintaining continuous operation of the existing facilities and minimizing operation impacts.

1.02 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.
 - 1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.
 - 2. Identify interruption to plant flow or utility services.
 - 3. Include a summary of safety procedures
 - 4. Identify locations of temporary protection and means of egress.
- C. Predemolition Photographs or Video Record: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by building demolition operations. Submit before Work begins.
- D. Inventory: After demolition is complete, submit a list of items that have been removed and salvaged.
- E. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.04 DEFINITIONS

- A. Demolish/Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.05 MATERIALS OWNERSHIP

- A. The Owner shall have first salvage rights to all fixtures, devices and equipment removed. Contractor to coordinate with Owner prior to demolition.

1.06 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

- B. Standards: Comply with ANSI A10.6 and NFPA 241.
- C. Predemolition Conference: Conduct conference at Project site to review methods and procedures related to demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review structural load limitations of existing structures.
 - 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review and finalize protection requirements.

1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable city, county, state, and federal codes for demolition work, disposal of debris, dust control, products requiring electrical disconnection and re-connection.
- B. Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction

1.08 PROJECT CONDITIONS

- A. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- B. Comply with other requirements specified in Section 01 7000.
- C. Arrange demolition schedule so as not to interfere with Owner's on-site operations.
- D. Owner will occupy another building immediately adjacent to demolition area. Conduct building demolition so Owner's operations will not be disrupted.
 - 1. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
 - 2. Maintain access to existing walkways, exits, and other adjacent occupied or used facilities.
 - a. Do not close or obstruct walkways, exits, or other occupied or used facilities without written permission from authorities having jurisdiction.
- E. Owner assumes no responsibility for buildings and structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- F. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
- G. Perform demolition operations in manner that in no way endangers personnel, public, existing structures, utilities, roadways, or facilities not to be demolished. If damages do occur, the Contractor will be held responsible and shall repair or replace any damage at no additional cost to Owner.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 DEMOLITION

- A. Remove items indicated on the Contract Drawings, for salvage and relocation.
- B. Fill excavations, open pits, and holes in ground areas generated as result of removals, using approved fill.

3.02 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of building demolition required.
- B. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are the same as those indicated in Project Record Documents.

- C. Inventory and record the condition of items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Engineer.

3.03 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with requirements in Section 01 7000.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - 6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 7. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
 - 8. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
 - 9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.
- C. Do not begin removal until receipt of notification to proceed from Owner.
- D. Do not begin removal until built elements to be salvaged or relocated have been removed.
- E. Protect existing structures and other elements to remain in place and not removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
- F. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Dismantle existing construction and separate materials.
 - 2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.04 EXISTING UTILITIES

- A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.
 - 1. Utility locations shown on the Plans should be considered approximate and may not be complete. Field verify all utility locations.
 - 2. Notice provided to each utility sufficiently in advance of such operations to allow the utility time to mark the location of, relocate, adjust, or otherwise protect their facilities. Reach an agreement with each utility on appropriate action necessary to protect or relocate the utility facilities. The cost of such action to protect the facilities, except for locates, shall be borne by the Contractor. Utilize Iowa Utility One-Call (800-292-8989) for locates for those utilities which subscribe to this service.
 - 3. At all times conduct operations so that necessary clearances are maintained and said utility facilities are protected. Comply with all Local, State, and Federal, or other regulations in performing work near utility facilities.

4. Should the Contractor damage any of the utility facilities during Contractor's operations or determine the work cannot be performed safely, the Contractor shall immediately notify the utility involved and cease work until arrangements are made to prevent further damage or a serious accident. The Owner is not responsible for the cost of any damage, including disruption of service, to any utility facility resulting from Contractor's operation.
 5. Failure of the Contractor to provide timely notice to the utility or to conduct operations in such manner that proper clearances are maintained and the utility facilities are protected at all times will be grounds for the issuance of a Stop Work Order.
- B. Protect existing utilities to remain from damage.
 - C. Do not disrupt public utilities without permit from authority having jurisdiction.
 - D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
 - E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
 - F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
 - G. Mark location and termination of utilities.
 - H. Disconnect, remove, cap, and identify designated utilities within demolition areas.
 - I. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
 - J. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.
 - K. Where there exists the potential for a conflict between the proposed line with an existing utility line, locate and expose any utility in advance of the proposed construction so determinations as to the required adjustments can be made.

3.05 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
 1. Verify construction and utility arrangements are as indicated.
 2. Report discrepancies to Engineer before disturbing existing installation.
 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Separate areas in which demolition is being conducted from areas that remain occupied.
 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.
- D. Remove existing work as indicated and required to accomplish new work.
 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
 2. Remove items indicated on drawings.
- E. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
 1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. See Section 01 1000 - Summary for limitations on outages and required notifications.
 4. Verify that abandoned services serve only abandoned facilities before removal.
 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.
- F. Removed and Salvaged Items:
1. Clean salvaged items of dirt and demolition debris.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area on-site.
 5. Protect items from damage during transport and storage.
- G. Protect existing work to remain.
1. Prevent movement of structure. Provide shoring and bracing as required.
 2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
 4. Patch to match new work.

3.06 MECHANICAL DEMOLITION

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
1. Remove structural framing members and lower to ground by method suitable to minimize ground impact or dust generation.
- C. Concrete: Cut concrete full depth at junctures with construction indicated to remain, using power-driven saw, then remove concrete between saw cuts.
- D. Masonry: Cut masonry at junctures with construction indicated to remain, using power-driven saw, then remove masonry between saw cuts.
- E. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished at junctures with construction indicated to remain, then break up and remove.
- F. Structural Steel: Dismantle field connections without bending or damaging steel members. Do not use flame-cutting torches unless otherwise authorized by Engineer.
- G. Equipment: Disconnect equipment at nearest fitting connection to services, complete with service valves. Remove as whole units, complete with controls.

3.07 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

3.08 REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by building demolition operations.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.09 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION 02 4100

**SECTION 03 3000
CAST-IN-PLACE CONCRETE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Concrete reinforcement.
- C. Waterstops.
- D. Joint devices associated with concrete work.
- E. Grout.
- F. Testing concrete
- G. Concrete used in the construction of utility structures, sidewalks, and miscellaneous structures.
- H. Miscellaneous concrete elements, including equipment pads and curbs and duct banks.
- I. Concrete curing.

1.02 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary.
- B. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction.
- C. ACI PRC-305 - Guide to Hot Weather Concreting.
- D. ACI PRC-306 - Guide to Cold Weather Concreting.
- E. ACI PRC-308 - Guide to External Curing of Concrete.
- F. ACI SPEC-301 - Specifications for Concrete Construction.
- G. ACI PRC-309-05 - Guide for Consolidation of Concrete.
- H. ACI 350R - Code Requirements for Environmental Engineering Concrete Structures and Commentary, 2006.
- I. ACI 350.1R - Tightness Testing of Environmental Engineering Concrete Structures; 2001.
- J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- K. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
- L. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- M. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
- N. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens).
- O. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
- P. ASTM C150/C150M - Standard Specification for Portland Cement.
- Q. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
- R. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
- S. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- T. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- U. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

- V. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete.
- W. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
- X. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- Y. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
- Z. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.03 DEFINITIONS

- A. Defective Areas: Surface defects that include honeycomb, rock pockets, cracks 0.005 inch wide and larger, cracks that leak in water-holding basins, spalls, chips, embedded debris, sand lines, bleed lines, leakage from form joints, fins and other projections, and form popouts.
- B. Qualified Mix Designer:
 - 1. Iowa/Dakota-registered professional engineer experienced in concrete mix design or
 - 2. Independent Testing Agency experienced in concrete mix design.
- C. New Concrete: Less than 60 days old.

1.04 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Shop Drawing:
 - 1. Product Data:
 - 2. Design Data: Concrete mix designs signed by qualified mix designer.
 - 3. Curing methods proposed.
 - 4. Detailed plan for cold weather curing and protection of concrete placed and cured in weather below 40 degrees F.
 - 5. Detailed plan for hot weather placements including curing and protection for concrete placed in ambient temperatures over 80 degrees F.
 - 6. Detailed plan for repair and patching of defective concrete areas.
- C. Concrete Mixes: Submit 30 days (minimum) prior to first scheduled concrete use.
 - 1. Summary Letter, certified by Mix Designer
 - a. Mix design summary letter from Mix Designer, including all of the following information for each concrete mix in the Project in tabular form:
 - 1) Concrete Mix Designation that will appear on Delivery Ticket.
 - 2) Name and location of ready mix plant(s) supplying this mix.
 - 3) Design F'c, slump and air content for this mix.
 - 4) Standard deviation of ready mix plant(s) used in calculation of F'cr for this mix, if applicable.
 - 5) Indicate whether mix design is based on "trial batches" or "field experience".
 - 6) F'cr for this mix.
 - 2. Mix Designs
 - a. For each Mix Designation identified in summary letter, submit:
 - 1) Mix design following ACI flow chart procedure.
 - 2) Weight and volume of all mix ingredients, including brand and type, if applicable.
 - 3) Water/cementitious ratio clearly identified.
 - 4) Coarse aggregate size designation, corresponding to a gradation submitted under paragraph above.
 - 5) Slump.
 - 6) Air content.

- 7) Compressive strength test results used to generate standard deviation for mix, if applicable.
 - 8) F'cr for mix.
 - 9) Compressive strength test results verifying that mix meets F'cr:
 - (a) Trial batch test results or
 - (b) Test results for similar mix "field experience".
- D. Quality Control:
1. Manufacturer's application instructions for bonding agent.
 2. Proposed application schedule and instructions for patching materials.
 3. Manufacturers' Certificate of Compliance:
 - a. Portland cement.
 - b. Admixtures.
 - c. Fly ash.
 - d. Bonding agent.
 - e. Patching materials.
 - f. Waterstop.
 4. Test Reports:
 - a. Admixtures, test reports showing chemical ingredients and percentage of chloride in each admixture and fly ash and cement.
 - b. Source test analysis report for fly ash.
 - c. Statement identifying aggregates reactivity and aggregate effects on concrete finish and appearance.
 5. Concrete Delivery Tickets. Submit certified copy of ticket for each load of concrete delivered to site. Hand to Owner's representative immediately upon arriving at job site. Include on ticket:
 - a. Name and location of batch plant and name of plant representative.
 - b. Ticket number.
 - c. Load number (batch number).
 - d. Date and truck number.
 - e. Destination of concrete in the Work (identified by elevation, grid, etc.).
 - f. Concrete type and class (strength) and Mix Designation.
 - g. Amount of concrete in cubic yards.
 - h. Time at which mixer drum was charged with cement.
 - i. Type, brand, and amount of cement.
 - j. Class, brand, and amount of fly ash.
 - k. Type, brand, and amount of each admixture added at plant.
 - l. Type, brand, and amount of fiber reinforcement.
 - m. Source and amount of each metered or weighed water added at plant.
 - n. Information necessary to calculate the total mixing water. Total mixing water includes free water on aggregates, batch water (metered or weighed) including ice batched at the plant, and wash water retained in the mixing drum.
 - 1) Aggregate moisture must be measured not less than once per day.
 - o. Maximum size of aggregate.
 - p. Mass (amount) of fine and coarse aggregate.
 - q. Actual water/cementitious ratio of load as it left batch plant.
 - r. Signature or initials of plant representative.
 - s. Amount of any materials added to drum after truck left batch plant; time at which additional materials were added; and reading of revolution counter.
 - t. Time of arrival of truck on site.
 - u. Time at which concrete unloading began, and reading of revolution counter.
 - v. Time at which concrete unloading was completed.

- w. If job-site testing is done on any concrete from load, identify test number for cross-referencing.
- x. If superplasticizer is added at site, record slump before and after addition of superplasticizer. Record time and/or drum revolutions as necessary to show that mixing complied with superplasticizer manufacturer's recommendations
- E. Test Reports: Submit report for each test or series of tests specified.
- F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301, ACI 318, and ACI 117 .
 - 1. Maintain one copy of each document on site.
- B. Acquire cement from same source and aggregate from same source for entire project.
- C. Follow recommendations of ACI PRC-305 when concreting during hot weather.
- D. Follow recommendations of ACI PRC-306 when concreting during cold weather.
- E. Batch Plant:
 - 1. Currently certified by the National Ready Mixed Concrete Association, or approved (in writing) to supply concrete to the Iowa Department of Transportation. Submit copy of certification
 - 2. Batch Plant Inspection:
 - a. Engineer shall have access to and have the right to inspect batch plants, cement mills, and supply facilities of Suppliers, manufacturers, and Subcontractors, providing products included in these Specifications.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Non-Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Form Facing for Exposed Finish Concrete: Steel.
 - 3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3. Provide stainless steel, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.
 - 4. Adhesive rebar anchors: See details on Drawings.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type I - Normal or Type II - Moderate Portland type. Tricalcium aluminate content of Type I Cement shall not exceed 12 percent.
 - 1. Acquire cement for entire project from same source.
 - 2. Hydraulic and Below grade Structures and Sewers: Type I or II cement mixed with fly ash.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
 - 2. Natural Aggregates:
 - a. Free from deleterious coatings and substances in accordance with ASTM C33, except as modified herein.
 - b. Free of materials and aggregate types causing popouts, discoloration, staining, or other defects on surface of concrete.
 - 3. Nonpotentially Reactive: In accordance with ASTM C33, Appendix XI, paragraph X1.1.
 - 4. Fine Aggregates:
 - a. Clean, sharp, natural sand.
 - b. Materials Passing 200 Sieve: 3 percent maximum.
 - c. Limit deleterious substances in accordance with ASTM C33, Table 1 with material finer than 200 sieve limited to 3 percent, coal and lignite limited to 0.5 percent.
 - 5. Coarse Aggregate:
 - a. Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).
 - b. Well-graded, per industry-standard definition (no gap-graded aggregates allowed).
 - c. Materials Passing 200 Sieve: 0.5 percent maximum.
- C. Pozzolan (Fly Ash): ASTM C 618, Class C or F, per Table 1 and 2,
- D. Water: ASTM C1602/C1602M .
- E. Blended Fiber Reinforcement: ASTM C1116/C1116M, engineered blend of two or more sizes of reinforcing fibers.
 - 1. Fiber Type: Alkali-resistant synthetic.
 - 2. Comply with ASTM D7508
 - 3. Products:
 - a. Fibermesh; Novomesh 950: www.fibermesh.com/#sle.
 - b. Master Builders Solutions; MasterFiber MAC 360 FF: www.master-builders-solutions.com/en-us/#sle.

2.04 ADMIXTURES

- A. Characteristics: Compatible with each other and free of chlorides or other corrosive chemicals.
- B. All admixtures shall be supplied from the same manufacturer and used in accordance with the manufacturer's recommendations.
- C. Air Entrainment Admixture: ASTM C 260; contain no chlorides.
- D. Water-Reducing Admixtures: ASTM C 494, Type A - Water Reducing and Type D - Water Reducing and Retarding.
- E. Superplasticizers:
 - 1. ASTM C494.
 - 2. Hold slump of 5 inches or greater for time required for placement into structure with maximum water-cement ratio specified.
 - 3. Furnish type as recommended by manufacturer for allowed temperature ranges.
 - 4. Type F.

2.05 ACCESSORY MATERIALS

- A. Patching Mortar:
 - 1. Contains no chlorides or other chemicals causing steel corrosion.
 - 2. Pre-manufactured product, cement-based, suitable for vertical and overhead applications.
 - 3. Compressive strength at 28 days: 6500 psi minimum
 - 4. Manufacturers:
 - a. BASF.
 - b. L&M Construction Chemicals.
 - c. Sika Chemical Corp.
 - d. Euclid Chemical Co.
- B. Adhered Waterstop:
 - 1. Adhered waterstop: hydrophilic, non-bentonite product.
 - 2. Specifically engineered as a concrete joint waterstop device
 - 3. Delay coating to protect fresh concrete.
 - 4. Manufacturers:
 - a. Greenstreak "Hydrotite".
 - b. DeNeef "Swellseal 8".
 - c. Or equal.
- C. Expansion Joint Filler: Neoprene, closed-cell, expanded, in accordance with ASTM D1056, Type 2C5 with compression deflection, 25 percent deflection (limits), 17 to 24 psi minimum.
- D. Chemical Hardener: Magnesium Fluorosilicate solution designed for densification of cured concrete slabs. Hardener shall be compatible with other specified floor treatments and curing compounds. Apply to all slabs unless noted otherwise.
- E. Non-Shrink Grout:
 - 1. ASTM C 1107.
 - 2. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
 - 3. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
 - 4. Manufacturers:
 - a. L&M Construction Chemicals, Inc., Crystex.
 - b. Euclid Chemical Co., Hi Flow Grout.
- F. Water Repellent: Penetrating silane siloxane specifically formulated and marketed for the purpose of producing surface water repellency on cast-in-place concrete.
 - 1. Approved Manufacturers:
 - a. Euclid
 - b. Master Builders
 - c. Sika

2.06 BONDING PRODUCTS

- A. Bonding Agent: ASTM C 1059, Type II acrylic non-redispersable type.
 - 1. Furnish as recommended by manufacturer for surface finish, pot life, set time, vertical or horizontal application, and forming restrictions.
 - 2. Use for all indicated "bonding agent" applications unless specifically directed otherwise on Drawings or by Engineer.
 - 3. Manufacturers:
 - a. BASF.
 - b. W.R. Meadows
 - c. L&M Construction Chemicals.
 - d. Sika Chemical Corp.
 - e. Euclid Chemical Co.
- B. Epoxy Bonding System: ASTM C 881, type as required by project conditions.

- C. Waterstops-PVC: PVC type, COE CRD-C 572.

2.07 CURING MATERIALS

- A. Membrane Curing Compound: ASTM C309 Type 1 - Clear or translucent, Class A.
- B. Moisture-Retaining Sheet: ASTM C171.
1. Curing paper, regular.
 2. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 3. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- C. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.
- D. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGNS

- A. Design:
1. Select and proportion ingredients using trial batches or field test data. Sample, cure, and test concrete mix through an approved independent testing laboratory in accordance with ACI 211.1
 2. ACI 301 and 318 each contain a flow chart for selecting proportions of concrete mixtures, and submitting the proposed mixes for approval. Contractor, concrete mix supplier and Mix Designer must all be familiar with basic requirements of flow chart and include the following basic elements in the design and submittal of all concrete mixes:
 - a. Determine whether sufficient test data exists to calculate appropriate standard deviations(s) for each ready mix plant that will supply concrete for the Work.
 - b. Calculate required average strength, F'_{cr} , for each concrete mix. F'_{cr} : Equal to F'_c plus 1,200 when data is not available to establish standard deviation.
 - c. Show that proposed mixes meet or exceed F'_{cr} by:
 - 1) Determining whether sufficient test data exists to prove adequacy of proposed mix by virtue of similarity to previously-produced concrete, or
 - 2) Preparing and testing trial batches.
 3. Concrete Compressive Strength, F'_c :
 - a. See schedule on Drawings
 4. Proportions
 - a. Design mix to meet aesthetic and structural concrete requirements.
 - b. In accordance with ACI 211.1, unless specified otherwise.
 - c. Water-cementitious (W/C) ratio shall control amount of total water added to concrete per schedule on Drawings
 5. Admixtures:
 - a. Air Content: Per schedule on Drawings.
 - b. Fly Ash: Per schedule on Drawings.
 6. Slump Range at Site (Maintain Until Consolidated in Form):
 - a. After adding superplasticizers: 5 to 8 inches.
 - b. Before adding superplasticizers: Per schedule on Drawings.
- B. Fiber Reinforcement: Add to mix at rate of 3 pounds per cubic yard, or as recommended by fiber manufacturer.

2.09 MIXING

- A. General: In accordance with ACI 304R.
- B. Truck Mixers:
1. Equip with electrically actuated counters to readily verify number of revolutions of drum or blades.
 2. Counter:
 - a. Resettable, recording type, mounted in driver's cab.
 - b. Actuated at time of starting mixers at mixing speeds.

3. Truck mixer operation shall furnish a concrete batch as discharged, that is homogeneous with respect to consistency, mix, and grading.
 4. Do not use nonagitating or combination truck and trailer equipment for transporting ready-mixed concrete.
 5. Concrete Volume in Truck:
 - a. Limit to 63 percent of total volume capacity, in accordance with ASTM C94, when truck mixed.
 - b. Limit to 80 percent of total volume capacity when central mixed.
 6. Mix each batch of concrete in truck mixer for minimum 70 revolutions of drum or blades at rate of rotation designated by equipment manufacturer.
 7. Perform additional mixing, if required, at speed designated by equipment manufacturer as agitating speed.
 8. Place materials, including mixing water, in mixer drum before actuating the revolution counter for determining number of mixing revolutions.
- C. Aggregates: Thoroughly and uniformly wash before use.
- D. Admixtures:
1. Air-Entraining Admixture: Add at plant through manufacturer-approved dispensing equipment.
 2. Water Reducers: Add prior to addition of superplasticizer.
 3. Superplasticizers and Air-Entraining Admixtures:
 - a. Add at concrete plant or at project site only through equipment furnished or approved by admixture manufacturer.
 - b. Equipment shall provide for easy and quick visual verification of admixture amount used for each dose.
 - c. Add discharge amount to each load of concrete into separate dispensing container, verify amount is correct, then add to concrete.
 - d. Additional dosage of superplasticizer may be added in the field using manufacturer-approved dispensing when unexpected delays cause too great of a slump loss.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.
- B. Form all concrete unless permitted otherwise by Engineer.
- C. Verify that forms are clean and free of rust before applying release agent.
- D. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- E. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
- F. Coat forms with release agent before placing reinforcing.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

- C. Verify requirements for concrete cover over reinforcement per ACI 318.
- D. Adhesive rebar anchors: Install in compliance with all requirements and recommendations of ICC Evaluation Service Report.

3.04 PLACING CONCRETE

- A. Notify Engineer not less than 24 hours prior to commencement of placement operations.
- B. Hand batch ticket for each load of concrete to ENGINEER at time of truck arrival on site.
- C. No additional water may be added to the concrete at any time after the truck has left the batch plant.
- D. Discharge Time:
 - 1. As determined by set time, do not exceed 1 1/2 hours after adding cement to water unless special approved time delay admixtures are used. Coordinate information with admixture manufacturer and Engineer prior to placing concrete.
 - 2. Adjust slump or air content at site by adding admixtures for particular load when approved by Engineer, then adjust plant dose rest of placement. Additional dosage at site shall be through an approved dispenser supplied by admixture manufacturer.
 - 3. Maintain required slump throughout time of concrete placement and consolidation. Discontinue use of superplasticizer if it fails to maintain slump in required range for the length of time required. Redesign mix, adjusting set control admixtures to maintain setting time in the range required.
- E. Placement into Formwork:
 - 1. Before depositing concrete, remove debris from space to be occupied by concrete.
 - 2. Prior to placement of concrete, dampen fill under slabs on ground, dampen sand where vapor retarder is specified, and dampen wood forms.
 - 3. Reinforcement: Secure in position before placing concrete.
 - 4. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 1.5 feet deep, except for slabs. Place and consolidate successive layers prior to initial set of first layer to prevent cold joints.
 - 5. Use placement devices, for example, chutes, pouring spouts, and pumps.
 - 6. Vertical Free Fall Drop to Final Placement: Maximum 4 feet in forms.
 - 7. Do not use aluminum conveying devices.
 - 8. Provide sufficient illumination for interior of forms so concrete at places of deposit are visible permitting confirmation of consolidation quality.
 - 9. Joints in Slabs:
 - a. Ensure space beneath plastic water stop completely fills with concrete.
 - b. During concrete placement, make visual inspection of entire water stop area.
 - c. Limit concrete placement to elevation of water stop in first pass, vibrate concrete under water stop, lift water stop to confirm full consolidation without voids, place remaining concrete to full height of slab.
 - d. Apply procedure to full length of water stops.
 - 10. If reinforcement is in direct sunlight or is more than 20 degrees F higher in temperature than concrete temperature before placement, wet reinforcement with water fog spray before placing concrete to cool reinforcement.
 - 11. Round off top exposed edges of walls with a 1/2 inch radius steel edging tool. Control joint edges round off exposed edge to 1/4-inch radius.
 - 12. Do not place concrete for supported elements until concrete previously placed in the supporting element has attained design strength.
- F. Retempering: Not permitted for concrete where cement has partially hydrated.
- G. Pumping of Concrete:

1. Provide standby pump, conveyor system, crane and concrete bucket, or other system onsite during pumping, for adequate redundancy to assure completion of concrete placement without cold joints in case of a primary placing equipment breakdown.
 2. Minimum Pump Hose (Conduit) Diameter: 4 inches.
 3. Replace pumping equipment and hoses (conduits) that are not functioning properly.
- H. Consolidation and Visual Observation:
1. Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude required to consolidate concrete in section being placed.
 2. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete.
 3. Consolidation Equipment and Methods: ACI PRC-309-05.
 4. Provide sufficient windows in forms, or limit form height, to allow for concrete placement through windows and for visual observation of concrete.
 5. Vibration consolidation shall not exceed a distance of 5 feet from point of placement.
 6. Vibrate concrete in vicinity of joints to obtain impervious concrete.
- I. Hot Weather:
1. Prepare ingredients, mix, place, cure, and protect in accordance with ACI 305R.
 2. Placement frequency shall be such that lift lines will not be visible in exposed concrete finishes.
 3. Maintain concrete temperature below 80 degrees F at time of placement. Ingredients may be cooled before mixing.
 4. Temperature of forms and reinforcement shall not exceed 90 degrees when concrete is placed.
 5. Make provisions for windbreaks, shading, fog spraying, sprinkling, ice, or wet cover, or other means to provide concrete with temperature specified.
 6. Prevent differential temperature between reinforcing steel and concrete.
- J. Cold Weather:
1. Maintain surface temperature of concrete above 40 degrees F and cure concrete as specified in Section 03 3900.
 2. Provide maximum and minimum thermometers placed on concrete surfaces spaced throughout Work to allow monitoring of concrete surface temperatures representative of Work.
 3. Contractor to furnish temperature records daily to Engineer. Keep for each pour for seven days. Record temperature at two hour intervals for:
 - a. Outside air.
 - b. Concrete as placed.
 - c. Air in coldest part of enclosure near concrete.
 - d. Locations as directed by Engineer.
 4. In accordance with ACI 306R and ACI 318.
 5. Heated Enclosures:
 - a. Heated enclosures may be used at any time during "cold weather" as defined by ACI 306.
 - b. Heated enclosures must be used when outdoor temperature falls below 5 degrees F.
 - c. Enclosures must be capable of supporting wind and snow loads and tight enough to prevent entrance of wind and weather.
 6. External Heating Units:
 - a. Vent heating units to atmosphere, and do not locally heat or dry concrete. Where water cure is specified, maintain wet condition.
 - b. Do not exhaust flue gases directly into an enclosed area to prevent concentrated carbon dioxide from causing concrete carbonation.
 - c. Provide continuous supervision of heating units when in use.
 7. Maintain curing conditions as specified in Section 03 3900.

8. Remove protection so concrete temperature drop does not exceed 2 degrees in any one hour and 40 degrees in the first 24 hours after protection removal.
- K. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

3.05 CONCRETE BONDING

- A. To Old Concrete:
 1. Mechanically roughen existing concrete surfaces to a clean, rough surface and provide a minimum roughness profile of 1/4 -inch.
 2. Apply bonding agent. Assure that new concrete is placed within the open window of the bonding agent. place grout as specified for new concrete.

3.06 INSTALLATION OF WATERSTOPS

- A. Adhered Waterstop: Secure with manufacturer-recommended method (nails, primer, etc.)

3.07 PATCHING

- A. General:
 1. Prior to starting patching work, obtain quantities of color-matched patching material and manufacturer's detailed instructions.
 2. Develop patching techniques with manufacturer on mockup panel.
 3. Dress surface of patches that will remain exposed to view to match color and texture of adjacent surfaces.
- B. Tie Holes:
 1. Fill with nonshrink grout, except where sealant is shown. Use only enough water to dry pack.
 2. Match color of adjacent concrete.
 3. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water.
- C. Defective Areas:
 1. Remove defective concrete to a depth of sound concrete.
 2. If chipping is required, make edges perpendicular to surface with a minimum of 1/2-inch in depth. Do not feather edges. Obtain Engineer's approval of chipping work.
 3. Patch defective area to match appearance of adjacent concrete surfaces.
- D. Blockouts at Pipes or Other Penetrations:
 1. Meet details shown or submit proposed blockouts for review.
 2. Use nonshrink grout.

3.08 CONCRETE FINISHING

- A. Notify Engineer of any Defective Concrete.
- B. Repair surface imperfections, including tie holes, immediately after removing formwork.
 1. Chip out honeycomb to sound concrete.
 2. Remove all bulges, fins, and small projections by chipping or tooling.
 3. Remove all undesired bolts, nails, ties, or other embedded metal to a depth of 1/2 inch from the concrete surface.
 4. Remove scale, dirt or other coatings which may impair bond; comply with ACI 318.
 5. Fill holes with patching mortar finished to match the surrounding concrete.
- C. Verify formwork joint offsets conform to ACI 117, as previously defined under Preparation.
- D. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- E. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

2. On below grade walls and members, provide specified finish a minimum of 1'-0" below final grade elevation.
- F. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
1. Surfaces to Be Left Exposed: Trowel as described in ACI PRC-302.1, minimizing burnish marks and other appearance defects.

3.09 CURING AND PROTECTION

- A. Immediately after finishing or stripping forms, apply continuous cover of polyethylene film.
1. Minimum Lap: Six inches (6").
 2. Keep film in place for seven (7) days.
- B. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- D. The following requirements shall be maintained until concrete has reached a minimum of 70 percent of its required compressive strength, or for 7 days, whichever is longer:
1. Do not allow temperatures of the concrete to fall below 50 degrees F, nor rise above 90 degrees F.
 2. Do not allow the temperature of the concrete surface to change more than 20 degrees F.
 3. Maintain wet curing requirements.
- E. The above requirements shall be maintained if forms remain in place, or have been removed in accordance with the Contract Documents.
- F. Formed Surfaces: Cure by moist curing with forms in place for full curing period or with forms removed with moisture retaining cover or curing compound.
1. Curing compound must be compatible with specified finish schedule. Forms shall be stripped in accordance with current ACI code.
 2. Cure surfaces in accordance with ACI 308R.
 3. Spraying: Spray water over surfaces and maintain wet for 7 days.
 4. Membrane Curing Compound: Apply compound in accordance with manufacturer's instructions in two coats, with second coat applied at right angles to first.
- G. Surfaces Not in Contact with Forms:
1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding.
 - a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
 - b. Spraying: Spray water over floor slab areas and maintain wet for 7 days.
 2. Final Curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Sheet: Lap strips not less than six inch and seal with waterproof tape or adhesive; secure at edges, maintain in place for not less than 4 days.
 - b. Absorptive Moisture-Retaining Sheet: Saturate burlap-polyethylene and place burlap - side down over floor slab areas, lapping ends and sides; maintain in place for 7 days.
 - c. Membrane Curing Compound: Apply curing compound in accordance with manufacturer's instructions in two coats, with second coat applied at right angles to first.
 3. Apply water repellent to all exterior concrete surfaces exposed to view.

3.10 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

- D. Compressive Strength Tests: ASTM C 39.
 - 1. For each test, mold and cure four concrete test cylinders if 6" cylinders are used. Mold and cure five concrete test cylinders if 4" cylinders are used. Obtain test samples for every 30 cu yd or less of each class of concrete placed. Not less than one test per day
 - 2. From each set of cylinders, an approved testing laboratory shall test one cylinder at 7 days and two 6" cylinders (three 4" cylinders) at 28 days. The final cylinder shall be properly stored until after the has reviewed the 7 and 28 day tests. Unless otherwise specified, the 7 day test shall be for informational purposes only. Concrete acceptance shall be based on the average of the two or three cylinders tested at 28 days.
 - 3. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - 4. Passing test shall be as defined in ACI 318.
- E. Slump Tests: ASTM C 143.
 - 1. A minimum of one slump test shall be taken for the first batch of concrete each day and for each set of test cylinders taken. Additional slump tests shall be taken whenever the consistency of concrete appears to vary.
- F. Air-content Tests: ASTM C 231, C173, or C 138.
 - 1. A minimum of one air-content test shall be taken for each set of test cylinders taken. Additional air-content tests shall be taken whenever the proportions of the concrete mix change.
- G. Concrete Temperature: ASTM C 1064.
 - 1. A record of concrete temperature shall be kept for each sample of concrete taken.
- H. Method and application of curing shall account for concrete temperature, air temperature, relative humidity, and wind velocity. When evaporation rates exceed 0.2 lb/sq.ft/hour, precautions shall be taken to prevent plastic shrinking cracking. Use Figure 2 1.5 of ACI 305R for evaluating.

3.11 PROTECTION OF INSTALLED WORK

- A. After curing and applying final floor finish, cover slabs with plywood or particle board, plastic sheeting, or other material to keep floor clean and protect it from material and damage due to other construction work.
- B. Patch and repair defective areas and areas damaged by construction.

3.12 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Engineer and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete with excessive honeycombing, embedded debris or concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Engineer. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

3.13 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections as directed.

END OF SECTION 03 3000

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**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel, aluminum, and stainless steel items.
 - 1. Miscellaneous Metals.
 - 2. Anchorage to Concrete.
 - 3. Gratings.

1.02 REFERENCE STANDARDS

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- E. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.
- F. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
- G. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire.
- H. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
- I. ASTM F594 - Standard Specification for Stainless Steel Nuts.
- J. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- K. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- M. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic).

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 2. Include erection drawings, elevations, and details where applicable.
 - 3. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements. Submit if requested.
- D. Welders' Certificates: Submit certification for welders employed on the project if requested, verifying AWS qualification within the previous 12 months.
- E. Post-installed concrete anchors:
 - 1. Manufacturer's published literature for all types on anchors in the Work.
 - 2. Copy of current ICC Evaluation Service (ICC-ES) report showing installation instructions, acceptance, special inspection requirements and restrictions.

- a. Evaluation reports from the Uniform Evaluation Service ("UES") may be submitted in lieu of ICC-ES reports.
3. Submit names and evidence of current certification for all workers who will install adhesive anchors in horizontal, upwardly-inclined or vertical (overhead) orientations. Certification must have been obtained within the past five years.

1.04 QUALITY ASSURANCE

- A. Use no salvaged, reprocessed, or scrap materials.
- B. Certified Adhesive Anchor Installer:
 1. Any adhesive anchor installed in horizontal, upwardly-inclined or vertical (overhead) orientations must be installed and inspected by certified installer/inspector.
 2. Certification shall include written and performance tests in accordance with ACI CPP 680.1, or equivalent, and shall have been completed within the past 5 years. Submit name(s) and certification(s) of certified adhesive rebar anchor installers.
- C. Codes and Standards:
 1. Comply with pertinent codes and regulations during installation of miscellaneous metal fabrications.
 2. Comply with recommendations of "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings" of AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
 3. Comply with recommendations of "Code of welding in Building Construction" of AMERICAN WELDING SOCIETY.
 4. Complete shop and field welding conforming to AISC M011.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Tubing (if required): ASTM A500/A500M Grade B cold-formed structural tubing. Hot-dip galvanized.
- B. Steel Pipe (if required): ASTM A 53/A 53M, Grade B Schedule 40, hot-dip galvanized finish.
- C. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, galvanized to ASTM A153/A153M where connecting galvanized components, grade A325.
- D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- E. Stainless steel plate (if required): ASTM A666, Type 304/304L.
- F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
- G. Shop and touch-up primer: See Division 9

2.02 ANCHORAGE TO CONCRETE, MATERIALS

- A. Anchor Bolts and Nuts (including threaded rod anchors): All bolts and nuts are to be stainless steel unless specifically indicated otherwise on Drawings.
 1. Stainless Steel:
 - a. Bolts: ASTM F593, Grade 316.
 - b. Nuts: AASTM F594, Grade 316.
 2. Anti-seize thread lubricant shall be liberally applied to externally and internally threaded stainless steel mating components of post-installed anchors immediately before installation.
- B. Adhesive Anchors and expansion anchors (for concrete and grout filled masonry): See Structural Drawings for acceptable manufacturers.
- C. Adhesive Anchors (for hollow masonry):
 1. System as indicated on Structural Drawings, with addition of screen tube.
 2. Screen Tubes as recommended by manufacturer.

3. Anchors may only be installed in hollow masonry if applied load is less than one half of the indicated allowable load on Structural Drawing detail. All other bolts to masonry shall be installed in grouted cells.
 4. If drawings specifically call for cells to be grouted in a specific location, then adhesive anchors may not be used there - use mechanical anchors.
- D. Screw-in anchors: Grade 304 or 316 stainless steel
1. Manufacturers: as indicated on Drawings.

2.03 GRATINGS

- A. General:
1. Grating finish, depth and thickness of bearing bars, and span direction shall be as designated on the drawings.
 2. Bearing bars shall be spaced at 15/16 inches on center and cross bars shall be spaced at 4 inches on center. Cross bars shall be flush at top with bearing bars.
 3. All grating edges shall be banded with bar equal in thickness and depth to the bearing bars. Provide openings shown. Openings not shown but required for piping and other items passing through may be field cut and banded. Touch up all welds with applicable finish.
 4. Unless noted otherwise, all grating shall be removable and not welded to supports, provide stainless steel saddle clips for attachment to structure. Limit weight of each section to no more than 120 pounds. Provide joints at center of openings where possible to permit removal of grating around items passing through.
- B. Steel Grating:
1. Material: Carbon Steel, Galvanized
 2. Construction Type: Welded rectangular grating conforming to NAAMM Standards.
 3. Load rating: As indicated on Drawings

2.04 FABRICATION

- A. Verify all existing dimensions, materials, and conditions are as shown on the drawings prior to any fabrication.
- B. Fabricate in accordance with reviewed shop drawings and reference standards.
- C. Fit and shop assemble items in largest practical sections, for delivery to site.
- D. Fabricate items with joints tightly fitted and secured.
- E. Continuously seal joined members by intermittent welds and plastic filler.
- F. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- H. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- I. Make joints and intersections of metal tightly fitting and securely fastened.
- J. Make work square, plumb, straight, and true.
- K. All butt welds shall be full penetration, unless noted otherwise.
- L. Drill or punch holes required for attachment of work of other trades and for bolted connections. Burned holes will not be accepted.
- M. Punch holes 1/16 inch larger than nominal size of bolts, unless otherwise specified.
- N. For thick metal, subpunch and ream drill holes.
- O. Connections not detailed or noted on the drawings shall be designed by the fabricator and approved by the Engineer.

- P. Provide other miscellaneous steel metal work including embedded and non-embedded steel metal work, hangers and inserts as specified on drawings.
- Q. Hot-dip galvanize after fabrication.
 - 1. For stitch-welded items to be hot-dip galvanized, provide 3/32-inch gap between overlapping surfaces of members as recommended in ASTM A385.

2.05 FINISHES

- A. Finishes - General
 - 1. Perform all fabrication including cutting, drilling punching, threading, and tapping prior to finishing.
 - 2. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
 - 3. Do not paint galvanized steel work unless indicated otherwise on Drawings.
- B. Finishes - Steel
 - 1. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

2.06 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS requirements.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed .
- G. After installation, clean and touch-up surfaces of shop primed metals.
- H. Coordinate installation schedule with other trades to ensure orderly and timely progress of work.

3.03 INSTALLATION OF CONCRETE ANCHORS

- A. Adhesive Anchors, Screw Anchors and Expansion Anchors: Install in strict compliance with Manufacturer's instructions and with limitations of ICC Reports.
 - 1. If requirements of Manufacturer's literature and ICC Report differ, the stricter of the two documents shall be followed.
- B. Do not cut off projecting threads of expansion and adhesive anchors unless specifically directed to do so in writing by Engineer.
 - 1. Any adhesive anchor or expansion anchor that has been cut off after installation without the express written direction of the Engineer is subject to removal and replacement at no additional cost to the Owner, regardless of the amount of modifications that may be required to accommodate the removal and replacement of such anchors.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

3.05 CLEANING

- A. Thoroughly clean surfaces of metal working contact with or embedded in concrete.

3.06 FIELD QUALITY CONTROL

- A. Notify Engineer when adhesive anchors are ready for each of two separate inspections. Allow 24 hours for Engineer's inspection. Any adhesive anchor completed without inspection is subject to rejection by Engineer, and subject to replacement by an additional adhesive anchor at no additional expense to Owner.

3.07 GALVANIC PROTECTION

- A. Protect dissimilar metals from galvanic corrosion, Install pressure tape, coating or isolator between dissimilar metals to avoid direct contact.

END OF SECTION 05 5000

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**SECTION 06 7413
FRP GRATING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Molded Fiberglass Reinforced Plastic Grating for the Rotary Drum Thickener polymer containment area.

1.02 REFERENCES

- A. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01 3000.
- B. Product Data: Submit manufacturer's published literature for specific products and accessories as applicable, including manufacturer's specifications, load/span/deflection tables, non-skid grit surface details, physical characteristics, performance data and installation recommendations.
- C. Product Submittal: The approved submittal sample shall become the standard for acceptable workmanship for the order.
- D. Shop Drawings: Submit shop drawings for the fabrication and installation of the grating. Include layout of hold-down clips.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store grating on pallets and cover. Do not top load. Separate each piece with a non-scratching spacer, such as wood.
- B. Protect from damage. Avoid sharp or impinging loads such as chain slings. Do not drag panels across one another unless separated by a non-scratching spacer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fibergrate Composite Structures.
- B. Amico-Seasafe.
- C. Strongwell.
- D. Fibergrate
- E. Engineer approved equivalent.

2.02 MATERIALS

- A. Resin: Vinylester.
- B. Color: Yellow.
- C. UV Protection: Standard resin, with UV protection integral to grating.
- D. Surface: Manufacturer's standard non-skid grit, permanently bonded to the grating surface.
- E. Flame spread (ASTM E84): 25 or less. Self-extinguishing per ASTM D635
- F. Hold-down clips and screws: Grade 316 stainless steel.
- G. Field-applied resin for sealing field cuts: As recommended by grating manufacturer's published literature.

2.03 DESIGN

- A. Grating must not deflect more than 1/4 inch under a uniform load of 100 pounds per square foot applied over the entire grating panel.

- B. Split grating at penetrations (sluice gate operators, etc.) and hold edge of grating 1 1/2" (+/- 1/2") away from obstruction.
- C. Hold-down clips shall be able to be removed and re-installed from above the surface of the grating.
- D. Grating shall be 1 1/2" deep with a 1 1/2" x 1 1/2" square pattern of cross bars.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Field verify all grating dimensions prior to fabricating. Grating that does not meet the end clearance requirements of the Drawings will be rejected.
- B. Inspect grating prior to installation to ensure grating is free from visual defects such as foreign inclusions, delamination, blisters, resin bumps, air bubbles and pits. The surface shall have a smooth finish (except for grit top surfaces) with an average of not over four surface pits per square foot of surface area, with no pits exceeding 1/8" diameter, or a 1/32" depth.

3.02 INSTALLATION

- A. Check supporting structures for correct layout and alignment. Verify that support surfaces are free of debris. Check measurement of grating to determine fit.
- B. Set the work accurately in location, alignment and elevation; plumb, level, true and free from rack; measured from established lines and levels.
- C. Fit grating panels together to form 1/4" joints at adjoining panels and at exterior curbs, unless otherwise indicated. Align bars of adjoining panels of grating.
- D. Tolerances of cuts and of fitting panels shall be $\pm 1/8"$.
- E. Sand and re-surface coat any scratches, crushed or chipped edges or cuts required in the field.
- F. Coat field-cut or sanded surfaces with resin furnished by manufacturer and applied in accordance with manufacturer's instructions.
- G. Provide bottom support under the entire perimeter of all panels unless shown otherwise on the drawings (such as the use of end panel connectors where panels butt together). All connectors are to be as specified and determined by grating supplier to be suitable for application.
- H. Hold-down clips shall be spaced a maximum of two feet apart with a minimum of four per piece of grating, unless otherwise noted.
- I. If the scope of work requires the Contractor to perform additional tasks which may damage the installed grating, the Contractor is responsible for covering the grating with plywood, or other suitable protective material.

END OF SECTION 06 7413

**SECTION 09 9000
PAINTING AND COATING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Responsibility for surface preparation and primary coating of equipment and motors shall be equipment manufacturers. Equipment to be finish coated and coating system is identified in equipment specification section(s).
- B. Field application of paints.
- C. See Schedule - Surfaces to be Finished, at end of this Section.

1.02 REFERENCES

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. AWWA C204 - Chlorinated Rubber-Alkyd Paint Systems for the Exterior of Above Ground Steel Water Piping.
- E. AWWA D102 - Painting Steel Water Storage Tanks.
- F. NACE (IMP) - Industrial Maintenance Painting; NACE International; current edition.
- G. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.
- H. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.
- I. SSPC SP-1 - Surface Preparation Specification No. 1 - Solvent Cleaning.
- J. SSPC SP-2 - Surface Preparation Specification No. 2 - Hand Tool Cleaning.
- K. SSPC SP-3 - Surface Preparation Specification No. 3 - Power Tool Cleaning.
- L. SSPC SP-5 - Surface Preparation Specification No. 5 - White Metal Blast Cleaning.
- M. SSPC SP-6 - Surface Preparation Specification No. 6 - Commercial Blast Cleaning.
- N. SSPC SP-7 - Surface Preparation Specification No. 7 - Brush-Off Blast Cleaning.
- O. SSPC SP-10 - Surface Preparation Specification No. 10 - Near-White Metal Blast Cleaning.
- P. SSPC SP-11 - Surface Preparation Specification No. 11 - Power Tool Cleaning to White Metal.
- Q. SSPC SP-12 - Surface Preparation Specification No. 12 - High Pressure Water Cleaning.
- R. SSPC SP-13 - Surface Preparation Specification No. 13 - Concrete Cleaning.
- S. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings.

1.03 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.
- B. Coatings: Heavy duty finishes for use on any surfaces, especially surfaces subject to submerged, high moisture, splash, or chemical environment.
- C. Ambient Conditions:
 - 1. Chemical: Surface subject to corrosive chemical splash or fumes.
 - 2. Moist: Surface subject to wet areas such as shower rooms and rooms with open tanks.
 - 3. Normal: Surface subject to normal temperatures and humidity such as found in offices and corridors.
- D. Splash: Surface subject to frequent washing and chemical splash.

- E. Submerged P: Surface submerged in potable water plus 1'-0" above high liquid level.
- F. Submerged NP: Surface submerged in nonpotable liquid plus 1'-0" above high liquid level.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on all finishing products.
- C. Samples: Actual color samples available for each type of coating scheduled. Colors to be approved by Owner.
- D. Literature:
 - 1. Submit manufacturer's literature stating application recommendations and generic makeup of each type of coating schedule.
 - 2. Substitutions: For coatings not specified herein, provide substitute manufacturer's literature with specified coating literature for Engineer to make proper evaluation.
- E. Letter of Certification/Shop Painting:
 - 1. Contractor has option of shop coating materials and equipment partially or totally.
 - 2. Submit the following for factory-applied coatings:
 - a. Coating used.
 - b. Manufacturer's written certificate factory-applied coating system identical to, or exceeding, requirements specified herein.
 - c. Requirements for touch-up or coating.
 - d. History of coating performance in same environment.
 - 3. Submit the following for factory-applied primer.
 - a. Primer used.
 - b. Contractor's certification factory-applied primer compatible with field-applied finish coat.
- F. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.
- G. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.05 QUALITY ASSURANCE

- A. Sampling of Materials:
 - 1. Engineer reserves the right to select unopened containers of materials furnished on job and have materials tested at approved laboratory. Owner will pay for first tests.
 - 2. Retests of rejected materials and tests of replacement materials shall be paid for by the Contractor.
 - 3. Remainder of contents of containers not required for testing will be returned to Contractor.
- B. Field Quality Control:
 - 1. Before beginning work, finish one complete room, space or item of each color scheme required, showing selected colors, finished texture, material, and workmanship. After approval, sample rooms or items shall serve as standard for similar work throughout the building.
 - 2. If coverage is not acceptable to the Engineer, Engineer reserves the right to require extra application of paint at no extra cost to Owner.
 - 3. Work at site where coat of material applied will be inspected by Engineer before application of succeeding specified coat, otherwise no credit for coat applied will be given and Contractor automatically assumes responsibility to recoat work in question. Furnish Engineer report of particular coat applied and when completed for inspection to comply with above.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
- D. Avoid danger of fire: Deposit cleaning rags and waste materials in metal containers having tight covers or remove from building each night. Provide fire extinguishers of type recommended by coating manufacturer in areas of storage and where finishing is occurring. Allow no smoking or open containers of solvents. Store solvents in safety cans.
- E. Empty containers shall have labels cancelled and be clearly marked as to use.
- F. Upon project completion, remaining material will become property of Owner. Seal material as required for storage, marked as to contents and shelf life, and store where required by Owner.
- G. Protect floor, ceiling, and un-painted walls from splatter or disfiguration.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- C. Maintain interior temperature and relative humidity of space, as recommended by coating manufacturer, 24 hours before applying and until coating is cured.
- D. Provide adequate lighting.

1.09 PROJECT/SITE CONDITIONS

- A. Protection:
 - 1. Cover material and surfaces, including floors and open tanks, adjoining or below work in progress with clean drop cloths or canvas.
 - 2. Remove hardware, accessories, plates, lighting fixtures, and similar items or provide protection by masking. Upon completion, replace above items or remove protection and clean.
 - 3. Maintain manufacturer's environmental requirements while coating dries.
- B. Cooperation: Work shall be scheduled and coordinated with other trades and shall not proceed until other work and/or job conditions are, in the judgment of the Owner's Construction Inspector, as required to achieve satisfactory results.

1.10 EXTRA MATERIALS

- A. See Section 01 6000 - Product Requirements, for additional provisions.
- B. Supply 1 gallon of each color, type, and surface texture; store where directed.
- C. Label each container with color, type, texture, and locations in addition to the manufacturer's label.

1.11 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Paints:
 - 1. Sherwin-Williams Co.
 - 2. Tnemec.
 - 3. Engineer approved equivalent.

2.02 PAINTS AND COATINGS - GENERAL

- A. Materials selected for coating system for each type of surface shall be product of same manufacturer.
- B. Paints and Coatings: Ready mixed.
- C. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
 - 2. For good flow and brushing properties.
 - 3. Capable of drying or curing free of streaks or sags.
- D. Color shall be formed of pigments free of lead, lead compounds or other materials which might be affected by presence of hydrogen sulfide or other gases likely to be present at project.
- E. Coatings shall meet surface burning characteristics as required by code and established by ASTM E84.
- F. Any surface not listed in the schedule of materials, shall be painted as scheduled for similar surfaces. In general, all non-ferrous metals, aluminum, stainless steel, chrome, and copper will not be painted.

2.03 SCHEDULE - COLORS

- A. Colors shall be selected and approved by Owner.
- B. In areas scheduled for finishing coat exposed piping, conduit, and ducts to match adjacent or near walls or ceilings, except for color coding.
- C. Equipment Colors (Equipment includes equipment, structural supports, and fasteners): Coat equipment same color as piping it serves.
- D. Where patching and repair occurs in rooms or spaces not scheduled for finish, finish to blend or match existing colors and surfaces. Carry finish to a natural boundary between new work and existing.

2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

2.05 MIXING AND TINTING

- A. Each coat - primer, intermediate, finish - shall be slightly darker than preceding coat to visually indicate adequate coverage, unless otherwise approved by the Engineer.
- B. Tint undercoats similar to finish coats, but with sufficient variations to distinguish between coats.
- C. Adjust stained finishes as necessary to obtain identical appearance on veneer and solid stock.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. If surfaces to be finished cannot be put into proper condition or finished by customary cleaning, sanding, and puttying operations or if surfaces were improperly primed by others, report defects to Engineer, in writing, or assume responsibility and correct unsatisfactory finish resulting from improper surfaces. Commencement of work indicates acceptance of surfaces.
- C. Materials removed and replaced to correct defects due to work placed on unsuitable surfaces shall be at Contractor's expense.

- D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- E. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Surfaces, including floors, shall be clean, dry, and free of loose dirt, dust, and foreign matter before applying coating.
- B. Comply with coating manufacturer's recommendations for surface preparation.
- C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
- E. Marks: Seal with shellac those which may bleed through surface finishes.
- F. Joints: All joints shall be caulked and sealed. This includes the joint or gap between the threaded flange and the pipe on all process piping. Caulking shall be a paintable polyurethane or silicone sealant such as BASF Sonolastic NP1, or an Engineer approved equivalent. Paint over sealant to match pipe color.
- G. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- H. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- I. Existing concrete walls:
 - 1. Thoroughly clean and lightly sand the existing epoxy surface to create a rough texture for better adhesion. Remove all loose and flaking coating. Feather the edges where existing coating has been removed.
 - 2. Contractor shall follow the appropriate paint systems for painting described later in the Paint Schedule in this specification.
 - 3. Contractor shall notify the Owner at least 7 days prior to starting work in the DAF Building.
 - 4. Contractor shall ensure that the surface preparation and painting in the above mentioned areas do not interfere with or hinder Owner's normal day-to-day operations.
- J. Plastic:
 - 1. Solvent clean pipe in accordance with manufacturer's recommendations.
 - 2. Hand sand with medium grit sandpaper to provide tooth for coating system.
 - 3. Large areas may be power sanded or brush-off blasted, provided sufficient controls employed so surface roughened without removing excessive material.
- K. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.
- L. Concrete Floors to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- M. Ferrous Metal:
 - 1. Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.
 - 2. Prepare welds and adjacent areas to remove undercutting or reverse ridges on weld bead, weld spatter on or adjacent to weld or area to be coated, and sharp peaks or ridges along weld bead. Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.
 - 3. Coat surfaces same day prepared and prior to "rust bloom". Re-prepare surfaces starting to rust before coating. Surface preparation shall be verified in accordance with SSPC-Vis 1, Vis 3, and ICRI templates.
 - 4. Cleaning Methods:

- a. Workmanship for metal surface preparation as specified shall conform to current SSPC specifications as follows;
 - 1) Solvent Cleaning: SP-1.
 - 2) Hand Tool Cleaning: SP-2.
 - 3) Power Tool Cleaning: SP-3.
 - 4) White Metal Blast Cleaning: SP-5.
 - 5) Commercial Blast Cleaning: SP-6.
 - 6) Brush-off Blast Cleaning: SP-7.
 - 7) Pickling: SP-8.
 - 8) Near-White Metal Blast Cleaning: SP-10
 - 9) Power Tool Cleaning to White Metal: SP-11.
 - 10) High Pressure Water Cleaning: SP-12.
 - 11) Concrete. Cleaning: SP-13.
- b. Wherever "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning" or similar words of equal intent are used in specifications or coating manufacturer's specifications, they shall be understood to refer to applicable SSPC specifications listed above.
- c. Use hand tools to clean areas that cannot be cleaned by power tools.
- 5. Shop Preparation: Equipment, structural steel, metal louvers, and similar items may be shop-prepared and primed at Contractor's option. Centrifugal wheel blast cleaning acceptable alternate to shop blast cleaning. Clean and prime in accordance with this section.
- 6. Field Touch-up: Sandblast items and equipment as specified to restore damaged surfaces previously shop or field blasted and primed. Materials, equipment, procedures, and safety equipment for personnel shall conform to SSPC.
- N. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- O. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

3.03 APPLICATION

- A. General:
 - 1. Apply products in accordance with manufacturer's instructions.
 - 2. Apply paint, enamel, and varnish with suitable brushes, rollers, or spraying equipment.
 - 3. Spread evenly and flow on smoothly without runs, lumps, or sags.
 - 4. Make edges of coating adjoining other materials or colors sharp and clean without overlapping.
 - 5. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
 - 6. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
 - 7. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
 - 8. Sand metal surfaces lightly between coats to achieve required finish.
 - 9. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
 - 10. Manufacturer-Applied Coating System:
 - a. Repair abraded areas on factory-finished items in accordance with manufacturer's directions.
 - b. Blend repaired areas into original finish.

11. Coverage and hide shall be complete. When color, stain, dirt, or undercoats show through final coat of paint the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage.
- B. Priming and Sealing:
 1. Refer to coating schedule for specific products.
 2. Shop:
 - a. Shop primer for ferrous metal shall comply with SSPC guidelines, and as specified in coating schedule of this specification.
 - b. Inspect shop-primed items at job site for compliance with contract documents. Schedule inspection with Engineer.
 - c. Hand or power sand chipped, peeled, or abraded primer and feather edges. Spot prime areas with specified primer.
 - d. Prior to application of finish coats, clean shop-primed surfaces free of dirt, oil, and grease.
 - e. Prepare and prime holdback areas as required for specified coating system.

3.04 CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Before substantial completion, remove masking, coating, and other material from floors, glass and other surfaces and remove rubbish and accumulated materials of whatever nature not caused by other trades from premises and leave in clean, orderly condition, with floors broom clean.
- C. All glass throughout shall have all paint or varnish spots and brush marks removed and, upon completion of the painting work, shall be washed and polished both sides.
- D. All glass that is scratched or damaged by the painter's work or while cleaning off the paint from the glass shall be replaced.
- E. Hardware and other unpainted surfaces shall be cleaned using lacquer thinner or paint remover. No edge tools or abrasives will be permitted.

3.05 SCHEDULE - SURFACES TO BE FINISHED

- A. Paint the surfaces described below under Schedule - Paint Systems.

3.06 SCHEDULE - PAINT SYSTEMS

- A. General
 1. Unless otherwise noted, Tnemec products are identified in this schedule to establish quality and type desired.
 2. Scheduled thickness or coverage rate is as recommended by Tnemec. If other manufacturers are used, manufacturer's requirements shall be followed, but in no case shall thickness or coverage rate be less than Tnemec.
 3. DFT = dry film thickness (mils/coat). DFT shown is for spray application. Additional coats may be required if brushed and rolled.
 4. sfpg = sq ft/gal (per coat).
 5. Examples of items to be coated are not all inclusive.
- B. Interior walls of the DAF Room shall be painted in accordance with the Room Finish Schedule in the Contract Drawings. Interior floor and ceiling shall not be painted, except in front of electrical equipment as noted on the Contract Drawings.
- C. New interior and exterior piping, equipment, and appurtenances regardless of type of factory-applied finish, where color coding required.
- D. Schedule:
 1. System 2 (Concrete Masonry, Interior Moist/Interior Splash, Semi-Gloss Sheen).
 - a. Application: Existing Masonry Walls.

- b. Preparation: Thoroughly clean and lightly sand the existing coated surface making sure to remove all loose, flake coating. Feather the edges where existing coating has been removed.
 - c. System:
 - 1) Spot Prime: bare surface/8.0 to 10.0 DFT "104-H.S. Epoxy".
 - 2) First Coat: 1 coat/4.0 to 6.0 DFT "104-H.S. Epoxy".
 - 3) Top Coat: 1 coat/4.0 to 6.0 DFT "104-H.S. Epoxy".
 - 2. System 3 (Ferrous Metals, Interior Moist/Interior Splash, Semi-Gloss Sheen).
 - a. Application: Steel, Equipment, Pipes, Structural Members .
 - b. Preparation: Ferrous Metal SP-6
 - c. System:
 - 1) Primer: 1 coat/2.5 to 3.5 DFT "90-97 Theme-Zinc, Zinc-rich Primer."
 - 2) Top Coat: 1 coat/4.0 to 6.0 DFT "N69-Color Hi-Build Epoxoline II."
 - 3. System 3A (Cast Iron and Ductile Iron, Interior Moist/Interior Splash, Semi-Gloss Sheen).
 - a. Application: Cast Iron and Ductile Iron pipes, fittings, valves, etc.
 - b. Preparation: Ferrous Metal SP-6.
 - c. System:
 - 1) Primer: 1 coat/2.5 to 3.0 DFT "N140 Pota-Pox Plus."
 - 2) Top Coat: 1 coat/4.0 to 6.0 DFT "135-Color Chembuild."
 - 4. System 3B (Recoating of Existing Ferrous Metals, Interior Moist/Interior Splash, Semi-Gloss Sheen).
 - a. Application: Cast Iron, Ductile Iron, Steel, Equipment, Pipes, Structural Members.
 - b. Preparation: Ferrous Metal. Hand tool, power tool clean; remove loose paint, scale, rust. SP-2, SP-3.
 - c. System:
 - 1) First Coat: 1 coat/2.5 to 3.5 DFT "135-Color Chembuild".
 - 2) Top Coat: 1 coat/2.5 to 3.5 DFT "135-Color Chembuild".
 - 5. System 14 (Dissimilar Metal Protection)
 - a. Application: Dissimilar Material.
 - b. Preparation: As required by material.
 - c. System:
 - 1) Primer: None.
 - 2) Top Coat: 1 coat/8.0 DFT "46-465 H.B. Tnemecol".
 - 6. System 22 (Cast-In-Place Concrete Under Grating - Chemical Containment Areas).
 - a. Application: Concrete floors and walls at chemical containment areas.
 - b. Preparation: SSPC-SP 13.
 - c. System:
 - 1) First Coat: 1 Coat/12.0 to 14.0 DFT "120-5002 Vinester".
 - 2) Top Coat: 1 Coat/12.0 to 14.0 DFT "120-5001 Vinester".
- E. Piping color coding and pipe labeling schedule:
 - 1. Provide with color band and arrow indicating direction of flow, and legend adjacent to valves, at not more than 20-foot spacing on straight pipe runs, adjacent to change in direction, and on both sides where pipes pass through walls or floors.
 - 2. Coordinate with Owner to match color coding system for piping.
 - 3. Provide pipe labels of size and color per Owner's approval indicating contents of pipe and flow direction.

3.07 FINAL TOUCH-UP

- A. Prior to substantial completion, examine coated surfaces and retouch or refinish to leave surfaces in condition acceptable to the Engineer.

3.08 CLEANING

- A. Before substantial completion, remove masking, coating, and other materials from walls and other surfaces and remove rubbish and accumulated materials of whatever nature not caused by other trades from premises and leave in clean, orderly condition, with floors broom clean.

END OF SECTION 09 9000

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**SECTION 22 0500
BASIC MECHANICAL REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Basic Mechanical Requirements specifically applicable to Division 22 and 23 Sections, in addition to General and Supplementary Conditions and General Requirements.
- B. The general provisions of this section apply to the other Division 22 and 23 sections where applicable.
- C. The work shall include the furnishings of systems, equipment and materials specified in this Division and as called for on the Mechanical Drawings, to include: supervision, operation, methods and labor for the fabrication, installation, startup and tests for the complete mechanical installation.
- D. Drawings for the work are diagrammatic, intended to convey the scope of the work and to indicate the general arrangement and locations of the work. Because of the scale of the Drawings, certain basic items such as pipe fittings, access panels, and sleeves may not be shown. Where such items are required for proper installation of the Work, such items shall be included.
- E. Equipment specification may not deal individually with minute items required such as components, parts, controls and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required, they shall be included by the supplier of the equipment, whether or not specifically called for.
- F. Where noted on the Drawings or where called for in other sections of the specification, the Contractor for this division shall install equipment furnished by others, and shall make required service connections. Contractor shall verify with the supplier of the equipment the requirements for the installation.
- G. Contractor to field verify the exact size and service of existing systems before making final connections.

1.02 REFERENCES

- A. Imposed Standards/Regulations
 - 1. Applicable provisions of the following codes and standards are hereby imposed on a general basis for the mechanical work (in addition to specific applications specified by individual work sections of these specifications and in addition to applicable local and state codes).
 - a. ANSI Pressure Piping Standards (B31-Series).
 - b. ASME Boiler and Pressure Vessel Code and State Boiler Code.
 - c. ASME Scheme for the Identification of Piping Systems (ANSI/ASME A13.1).
 - d. American Gas Association.
 - e. AWS Standards for Welding.
 - f. National Electric Code.
 - g. NFPA Standards and Pamphlets.
 - h. Local and/or State Plumbing, Mechanical and Building codes.
 - i. Uniform Plumbing Code.
 - j. International Mechanical Code.
 - k. International Building Code.
 - 2. Every installation shall comply with applicable sections of every other specification. Changes required to conform shall be made without increase in contract price, after approval by Engineer in writing. If changes are required to obtain above approvals, Contractor shall submit them to Engineer for approval, after which revised data shall be submitted and written approval obtained. Changes shall be made without increase in contract price.

3. Installations must be entirely safe in every respect, and must not create any condition of any kind which will be harmful to any occupant of building, to operating personnel, to installation personnel, to testing personnel, to workmen, and to public; Contractor for each installation shall be solely responsible for providing installations which will meet these conditions. If Contractor or Manufacturer believes that installation will not be safe for all parties, they shall so report in writing to the Engineer before any equipment is purchased or work is installed, giving exact recommendations.
4. Manufacturer of each type of equipment used by itself or as a part of any system shall carefully check capacities, arrangements, and methods shown or specified (including space requirements, servicing requirements, ambient air temperatures, etc.) for installation of their equipment, and all connections to other system or to parts of same system to assure that when used, connected, interconnected, piped, wired, or controlled as specified, it can be properly serviced. If the manufacturer has any reservations in this regard, they shall state the reservations and/or suggested changes in a separate letter addressed to the Engineer and shall include this letter as a part of the shop drawing submission.
5. If Contractor fails to call such reservations or suggestions to Engineer's attention, in writing, before any work is done or equipment is purchased, it will be assumed that they accept responsibility for providing a completely safe and completely coordinated installation. If at a later date changes become necessary to assure a completely safe and coordinated installation, they shall be made, as approved by Engineer, without increase in contract price.

B. Permits and Tests

1. The Contractor shall obtain and pay for all fees, permits and licenses required by Work, unless otherwise noted in the detailed contractual description preceding these mechanical specifications.
2. All applications required for the procuring of new utility services to the building (gas, water, sewer, or steam) shall be properly filed by the Contractor with the utility company.
3. Submit a record copy (for Owner's records) of mechanical work notices, permits, licenses, inspection or test reports, and similar items obtained in response to governing and imposed regulations and standards.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04 PROJECT/SITE CONDITIONS

- A. Inspect site prior to bidding to be thoroughly familiar with existing conditions.
- B. Work to be installed as shown on Drawings, unless prevented by actual project conditions.
- C. Prepare and submit drawings with bid proposal showing proposed rearrangement of work, if required, to meet actual project conditions, including changes to work specified in other Sections. Approval by Engineer required before proceeding. No extras can be allowed on work required by discrepancies in actual project conditions after contract for work has been awarded.

1.05 SEQUENCING/SCHEDULING

- A. See Section 01 1000 - Summary, for project sequence and scheduling requirements.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. All materials and equipment shall be fully guaranteed by the Contractor to be free from defects and to be new equipment; no second-hand, used, or salvaged equipment will be allowed.
- C. Replacement of any part which fails within one year from the date of acceptance shall be made by the Contractor without cost to the Owner.
- D. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 PRODUCT AND PERFORMANCE QUALITY

- A. All materials shall be the standard product of a reputable manufacturer regularly engaged in the manufacture of the specific product, and where more than one unit is required of the item, all shall be of the same manufacturer.
- B. The Engineer reserves the right to refuse approval on equipment which does not meet the specification in their opinion, or on equipment for which no local experience of satisfactory service is available. The Engineer further reserves the right to reject equipment for which maintenance service and the availability of replacement parts is questionable.
- C. Any materials not conforming to the specification will be ordered removed any time during the course of construction, and the Contractor shall replace such items, when notified, at their own expense.
- D. All elements of the construction shall be performed by workmen skilled in the particular craft involved, and regularly employed in that particular craft. All work shall be performed in a neat, workmanlike manner in keeping with the highest standards of the craft.
- E. It will be the Contractor's responsibility to examine fully the drawings and specifications, to take the required measurements, to verify dimensions and to fit Work into the schedule of other Contractors, and to progress the contract as expeditiously as possible, so that the progress of the work is orderly and does not occasion excessive cutting and patching of this new structure.
- F. This Contractor shall be pecuniarily responsible for the cutting and patching of the structure occasioned by failure to install sleeves, grilles or other items required by the mechanical work at the proper time for the normal installation of such items.
- G. All ductwork shall be measured on the job prior to fabrication. Piping rough-in dimensions and locations shall be verified with the Owner or supplier of equipment furnished by others prior to the time of roughing-in.

2.02 SUBSTITUTIONS

- A. See Section 01 6000 - Product Requirements for product requirements and substitution procedures.
- B. Proposals as submitted shall be based on the products specifically named in the specifications.
- C. If specific products of more than one manufacturer are specified, the choice of these shall be made optional with the Contractor.
- D. All products are subject to review by the Engineer both before and after incorporation in the project.
- E. Should suppliers of materials not specified wish to bid their material as a base bid equal, they shall submit specific product data for each proposed substitution and secure the written approval of the Engineer that their product is acceptable as an equal to that specified at least ten (10) days in advance of the bid date to have their products covered in an Addendum prior to opening of bids. The burden of proof of equivalence is on the proposer.

2.03 RECORD DRAWINGS

- A. See Section 01 7800 - Closeout Submittals for additional project record drawing requirements.
- B. Contractor shall prepare and submit to Engineer a drawing showing the exact location of all concealed, above ground and underground piping and ductwork. Drawing shall give accurate location dimensions and sizes of all such piping, ductwork, and equipment for future use by the Owner.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that areas are ready to accept Work.

3.02 PROTECTION

- A. Special care shall be taken for the protection of equipment furnished by this Contractor. Equipment and material shall be completely protected from weather elements, painting, plaster, etc. until the project is completed. Damage from rust, paint, scratches, etc. shall be repaired as required to restore equipment to original condition.
- B. Protection of equipment during the plastering and painting of the building shall be the responsibility of the Contractor performing that work, but this shall not relieve this Contractor of the responsibility of checking to assure that adequate protection is being provided.
- C. Where the installation or connection of equipment requires this Contractor to work in areas previously finished by other Contractors, this Contractor shall be responsible that such areas are protected and are not marred, soiled or otherwise damaged during the course of such work. This Contractor shall arrange with the other Contractors for repairing and refinishing of such areas which may be damaged.
- D. When heavy materials must be placed upon or transported over the roof deck, sheeting shall be placed to distribute weight and support such materials. Any damage shall be immediately corrected at no cost to the owner.

3.03 ACTIVE SERVICES

- A. Existing active utility services: water, gas, sewer, electric, when encountered, shall be protected against damage. Do not prevent or disturb operation of active services which are to remain. If active services are encountered which require relocation, make request to utility or municipality with jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the Utility or Municipality having jurisdiction.
- B. Temporary shutdowns shall be coordinated with the Owner to minimize the interruptions to the Owner's normal business activities.

3.04 COORDINATION

- A. The Mechanical Contractor shall coordinate Work with all other trades prior to installation. Some spaces are extremely tight and shall require careful cooperation.
- B. No piping shall be run over the top of any electrical panels or electrical equipment.
- C. The determination of quantities of material and equipment required shall be made by the Contractor from the drawings. Schedules on the drawings and in the specifications are completed as an aid to the Contractor but where discrepancies arise, the greater number shall govern.
- D. Where the specifications state that equipment shall be "furnished", "installed", or "provided", it shall be understood to mean this Contractor shall furnish and install completely unless it is specifically stated that the equipment is to be furnished and/or installed by others.

3.05 OPENING, CUTTING, AND PATCHING

- A. This Contractor shall provide cutting and patching and patch painting in the existing structure as required for the installation of Work, and shall furnish lintels and supports as required for openings. Cutting of structural support members will not be permitted without prior approval of the Engineer. Extent of cutting shall be minimized; use core drills, power saws or other machines which will provide neat, minimum openings. Patching shall match adjacent materials and surfaces and shall be performed by craftsmen skilled in the respective craft required.
- B. This Contractor shall furnish to the General Contractor the accurate locations and sizes for required openings, but this shall not relieve this Contractor of the responsibility of checking to assure that proper size openings are provided. When additional patching is required due to this Contractor's failure to inspect this work, then this Contractor shall make arrangements for the patching required to properly close the openings, to include patch painting, and this Contractor shall pay any additional cost incurred in this respect.

- C. When cutting and patching of the structure is made necessary due to this Contractor's failure to install piping, ducts, sleeves or equipment on schedule, or due to this Contractor's failure to furnish, on schedule, the information required for the leaving of openings, then it shall be this Contractor's responsibility to make arrangements for this cutting and patching and this Contractor shall pay any additional cost incurred in the correction.

3.06 WIRING FOR MECHANICAL EQUIPMENT

- A. Division 26 Contractor will provide power services for motors and equipment furnished by this Contractor to include safety disconnect switches and final connections.
- B. This Contractor will be responsible for internal wiring, alarm wiring, control wiring or interlock wiring for equipment furnished by him to include temperature control wiring.
- C. Division 26 Contractor will furnish motor starters for motors furnished by this Contractor, except where other Sections call for starters to be furnished by them.
- D. This Contractor shall furnish to the Division 26 Contractor shop drawings and a schedule for all motors and other mechanical equipment which require electrical services. The schedule shall include the exact locations for rough-ins, electrical loads, size, and electrical characteristics for all services required.
- E. Where motors or equipment furnished by this Contractor require larger services or services of different electrical characteristics than those called for on the Electrical Drawings, due to this Contractor furnishing substitute equipment, then additional cost in this respect shall be paid for by this Contractor.
- F. This Contractor shall review the Electrical Drawings and shall call to the attention of the Engineer, prior to bidding, omissions of electrical services required for equipment, and shall verify extent of Electrical Contractor's work.

3.07 EQUIPMENT INSTALLATION

- A. Erect equipment in neat and workmanlike manner, align, level and adjust for satisfactory operation, install so that connecting and disconnecting of piping and accessories can be made readily and so that all parts are easily accessible and removable for inspection, operation and maintenance.

3.08 NOISE AND VIBRATION

- A. Mechanical equipment shall operate without objectionable noise or vibration as determined by the Engineer. If such objectionable noise or vibration should be produced and transmitted to occupied portions of the building by apparatus, piping, ducts or other parts for the mechanical work, make necessary changes and additions, as approved, without extra cost to the Owner.

3.09 PAINTING IDENTIFICATION

- A. Identification
 - 1. Identify valves and dampers with stamped metal tags. Information on tags to include system information, valve number and other pertinent coding marks that coordinate with the drawings, ducts or schedules.
 - 2. Provide Owner with a schedule listing valve and damper number and their location.
 - 3. Identify piping systems on both sides of wall, floor and ceiling penetrations, and pipe shafts with color coded markers identifying pipe contents and direction of flow. Markers shall be affixed to pipes at valves used by operators (hose stations, etc.) near connections of pumps and equipment and at intervals not exceeding 20 feet.
 - 4. Proposed markers and samples shall be submitted to Engineer for approval.
 - 5. Color coding and labeling shall match existing or in accordance with the latest edition of ANSI/ASME A13.1.

3.10 TEST AND DEMONSTRATION

- A. Systems shall be tested and placed in proper working order prior to demonstrating systems to Owner.

- B. Prior to acceptance of the mechanical installation, the Contractor shall demonstrate to the Owner or their designated representatives all essential features and functions of all systems installed, and shall instruct the Owner in the proper operation and maintenance of such systems.
- C. Contractor shall furnish the necessary trained personnel to perform the demonstrations and instructions and shall arrange to have the manufacturer's representatives for the system present to assist with the demonstrations. The Owner and Contractor shall each sign a certification stating that the training has been performed and the Owner accepts same.

3.11 SITE

- A. The site shall be kept orderly and reasonably clean at all times during construction. At the conclusion of the construction, the site shall be cleaned thoroughly of all rubble, debris, and unusual materials.
- B. All tunnels, chases, and closed-off spaces shall be cleaned of all waste materials, wood framing, and other construction materials.
- C. The storing of all materials during construction shall be as directed by the Owner in areas designated for that purpose.

END OF SECTION 22 0500

SECTION 22 0523.12
SWING CHECK VALVES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Swing Check Valves with outside lever, weight, and accessories.

1.02 REFERENCES

- A. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
- B. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.
- C. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants.
- D. AWWA C606 – Standard Specification for Grooved and Shouldered Joints.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit the following as appropriate for each valve provided:
 - 1. Outline and installation drawings for equipment and fixtures furnished.
 - 2. Equipment performance data and operating characteristics.
 - 3. Manufacturer's catalog data, marked to indicate materials being furnished as standard equipment, fixtures, specialties, and accessories.
 - 4. Shop Drawings on shop-fabricated systems.
 - 5. Drawings showing arrangement of piping, controls, and accessory equipment furnished.
 - 6. Submit detailed product data and descriptive literature including dimensions, weights, headloss data, pressure rating and materials of construction.
- C. Manufacturer's Certificates: Certify that products of this section meet or exceed specified requirements.
- D. Operation and Maintenance Manual as described in Section 01 7800.

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with conditions at site.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- E. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- F. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- G. Arrange storage in a manner to provide easy access for inspection.
- H. Maintain storage conditions to prevent deterioration or damage.
- I. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- J. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- K. Handle products by methods to prevent bending or overstressing.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified Service Representative to perform functions described in Section 01 4000 and to sign the Certificate of Proper Installation attached to Section 01 4000.
- B. Include necessary trips by the Manufacturer's representative to provide one 8-hour work day on-site (travel time not included) for startup and training of operations personnel.
- C. Any additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 SWING CHECK VALVES

- A. General:
 - 1. Globe style.
 - 2. Service: Thickened WAS and Thickened Sludge
 - 3. Outside lever and adjustable outside weight.
 - 4. Prevent backflow and water tight.
 - 5. Check valves by the same manufacturer.
 - 6. Outside lever/weight when looking at inlet flange face (downstream) as shown on Contract Drawings.
 - 7. The valve body shall be the full waterway type, designed to provide a net flow area not less than the nominal inlet pipe size when swung open no more than 25 degrees.
 - 8. The valve shall swing open smoothly at pump start and close quickly and quietly upon pump shutdown to prevent flow reversal. When closed, the valve shall seat drip tight.
 - 9. Outside lever shall allow an operator to manually open the check valve wide open to back flush a pump.
- B. Body, Cover, Disc Lever and Disc Arm:
 - 1. Cast iron or ductile iron.
- C. Joints: Integral flanged joint ends, ANSI B16.1 Class 125.
- D. Body Seat: Stainless steel, replaceable.
- E. Shaft: Stainless steel.
- F. Disc: Ductile iron and faced with a renewable resilient seat ring of rubber or other suitable material, held in place by a follower ring and stainless steel screws.
- G. Seat Retaining Screws: Stainless steel.
- H. Coating: Exterior primer compatible with epoxy field coating as per Section 09 9000.
- I. Pressure Rating: 150 psi (minimum).
- J. Valve shall be capable of operating in the horizontal position.
- K. Approved Manufacturers:
 - 1. Valmatic.
 - 2. DeZurik, Series 6000.
 - 3. Engineer approved equivalent.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions as shown on the plans by qualified craftsmen.
- B. Location, orientation, and quantities as shown on the plans.

- C. Include all required related items necessary for a complete installation.
- D. Surface preparation shall follow the piping surface preparation specification. Contractor shall be responsible for compatibility of manufacturer's shop coating and final finish.
- E. Support independently from piping.

END OF SECTION 22 0523.12

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**SECTION 22 0523.15
ECCENTRIC PLUG VALVES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Eccentric Plug Valves and Accessories.

1.02 REFERENCES

- A. ASTM A48 - Standard Specification for Gray Iron Castings.
- B. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
- C. ASTM A536 - Standard Specification for Ductile Iron Castings.
- D. AWWA C550 - Standard Specification for Protective Epoxy Interior Coatings for Valves and Hydrants.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit the following as appropriate for each valve provided:
 - 1. Outline and installation drawings for equipment and fixtures furnished.
 - 2. Equipment performance data and operating characteristics.
 - 3. Manufacturer's catalog data, marked to indicate materials being furnished as standard equipment, fixtures, specialties, and accessories.
 - 4. Shop Drawings on shop-fabricated systems.
 - 5. Drawings showing arrangement of piping, controls, and accessory equipment furnished.
- C. Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.
- D. Operation and Maintenance Manual as described in Section 01 7800.

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with conditions at site.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- E. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- F. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- G. Arrange storage in a manner to provide easy access for inspection.
- H. Maintain storage conditions to prevent deterioration or damage.
- I. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- J. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- K. Handle products by methods to prevent bending or overstressing.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and to sign the Certification of Proper Inspection attached to Section 01 4000.

- B. Include necessary trips by the Manufacturer's representative to provide one 8-hour work day on-site (travel time not included) for startup and training of operations personnel.
- C. Any additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. DeZurik.
- B. Valmatic.
- C. Engineer approved equivalent.

2.02 ECCENTRIC PLUG VALVE

- A. General:
 - 1. All valves shall be of the tight-closing, resilient-faced plug type.
 - 2. Valves shall be capable of submerged service.
 - 3. No metal-to-metal seating surfaces shall be permitted.
 - 4. Valves shall be of bi-directional eccentric seating such that the opening movement of the plug results in the plug rising off the body seat contact.
 - 5. Valves shall be drop tight at the rated pressure.
 - 6. Valves shall be satisfactory for throttling service, frequent operation, very infrequent operation, and open/close valve operation.
 - 7. Valve plug shall rotate 90 degrees from the full open to tight shut position.
 - 8. Valves shall be fitted with grease fittings in bearing journal area.
 - 9. Valves shall be full port.
 - a. The port area shall be the same as the pipe area and face to face distance of flanges shall be larger than that of standard port valves.
 - 10. The plug shall have a cylindrical seating surface eccentrically offset from the center of the shaft. Plug shall not contact the seat until at least 90% closed. Spherical shaped plugs are not acceptable.
 - 11. All valves by the same manufacturer.
 - 12. See valve schedule in Section 22 0610.01 for more information.
- B. Body, Bonnet, Stuffing Box: Ductile iron ASTM A395 Grade 64-45-15.
- C. Bolts and Nuts: stainless steel.
- D. Valve Ends: Flanged.
- E. Plug/Shaft: Cast iron ASTM A126, Class B; Cast iron ASTM A48, Class 40; Ductile iron ASTM A536, Grade 65-45-12, Integral plug and shaft; or Ductile iron ASTM A395 Grade 64-45-15. A two piece shaft is not acceptable.
- F. Resilient Facing: Neoprene or Buna-N, 70 durometer hardness.
- G. Body Seats: 99% Nickel, welded-in.
- H. Bearings: Oil impregnated 316 Stainless Steel sleeve-type trunnion bearings and top and bottom thrust bearings.
- I. Shaft Seal: V-type self-adjusting packing or 2 complete sets of U-cup seals, replaceable without disassembling valve.
- J. Shaft Extensions: Stainless steel, as noted on the Plans, if required.
- K. Operator: Type as noted on the plans and valve schedule. All actuators shall be sized for full valve rating in bi-directional service.

- L. Coating: Buried valves shall have manufacturer's standard exterior asphalt or epoxy coating. Above-grade valves shall have manufacturer's standard exterior primer, compatible with epoxy field coating as per Section 09 9000.
- M. Pressure Rating: 150 psi minimum, drip-tight closure.
- N. Direction of Operation: Counterclockwise (left) to open.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions as shown on the plans by qualified craftsmen.
- B. Location, orientation, and quantities as shown on the plans.
- C. Include all required related items necessary for a complete installation.
- D. Coat nuts and bolts with anti-seize thread compound.
- E. Install with stem between 9:00 and 3:00 position (stem shall not be inverted). Valves in pipelines with suspended solids, slurries, or grit service shall be installed with stem at 9:00 or 3:00 position (horizontal) and plug at 12:00 position (up) when fully open.
- F. Surface preparation shall follow the piping surface preparation specification. Contractor shall be responsible for compatibility of manufacturers shop coating and final finish.
- G. Support independently or from piping.

END OF SECTION 22 0523.15

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**SECTION 22 0523.21
COMBINATION AIR RELEASE AND AIR VACUUM VALVES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Combination Air Release and Air Vacuum Valves and Accessories.

1.02 REFERENCES

- A. AWWA C512 - Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service.
- B. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit the following as appropriate for each valve provided:
 - 1. Equipment performance data and operating characteristics.
 - 2. Product data and descriptive literature including dimensions, weights, capacity data, pressure rating and materials of construction.
 - 3. Manufacturer's catalog data, marked to indicate materials being furnished as standard equipment, fixtures, specialties, and accessories.
 - 4. Drawings showing arrangement of piping, controls, and accessory equipment furnished.
- C. Manufacturer's Certificates: Certify that products of this section meet or exceed specified requirements.
- D. Operation and Maintenance Manual as described in Section 01 7800.

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with conditions at site.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- E. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- F. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- G. Arrange storage in a manner to provide easy access for inspection.
- H. Maintain storage conditions to prevent deterioration or damage.
- I. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- J. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- K. Handle products by methods to prevent bending or overstressing.

1.05 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 COMBINATION AIR RELEASE AND AIR VACUUM VALVES

- A. All valves of the single housing type that combines both an air release valve and an air/vacuum valve.
- B. All valves supplied by the same manufacturer.
- C. Meet the full requirements of AWWA C512.
- D. Construction:
 - 1. Body and Cover: Cast iron or ductile iron.
 - 2. Cover Bolts: Cadmium or zinc plated steel or stainless steel.
 - 3. Cover Gasket: Resilient.
 - 4. Size: As shown on the drawings.
 - 5. Valve Inlet Type: Flanged.
 - 6. Valve Outlet Type: Same as inlet.
 - 7. Seats: Buna-N and stainless steel.
 - 8. Floats: Stainless steel.
 - 9. All Other Internal Parts: Stainless Steel.
 - 10. Bias mechanism: all valves
 - 11. Coating: AWWA C550 epoxy coating, inside of body and cover. Manufacturer's standard exterior primer, compatible with epoxy field coating as per Section 09 9000.
 - 12. Pressure rating: 150 psi.
 - 13. Valves will be equipped with a camlock backflush assembly.
- E. Approved Manufacturers:
 - 1. ARI D020 or D025L.
 - 2. Engineer approved equivalent.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions as shown on the plans by qualified craftsmen.
- B. Location, orientation, and quantities as shown on the plans.
- C. Include all required related items necessary for a complete installation.
- D. Surface preparation shall follow the piping surface preparation specification. Contractor shall be responsible for compatibility of manufacturers shop coating and final finish.
- E. Support independently or from piping.
- F. Furnish and install piping and fittings from valve outlet to exhaust point, if necessary, as shown on the plans.

END OF SECTION 22 0523.21

**SECTION 22 0523.50
MISCELLANEOUS VALVES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metallic (stainless steel) ball valves.
- B. Plastic ball valves.

1.02 RELATED SECTIONS

- A. Section 22 1005 - Plumbing Piping. For building plumbing service piping.

1.03 REFERENCES

- A. ASTM A48 - Standard Specification for Gray Iron Castings.
- B. ASTM D1784 - Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit the following as appropriate for each valve provided:
 - 1. Outline and installation drawings for equipment and fixtures furnished.
 - 2. Equipment performance data and operating characteristics.
 - 3. Manufacturer's catalog data, marked to indicate materials of construction, fixtures, specialties, and accessories.
 - 4. Drawings showing arrangement of piping, controls, and accessory equipment furnished.
- C. Manufacturer's Certificate: Certify that products of this section meet or exceed specified requirements.
- D. Operation and Maintenance Manual as described in Section 01 7800.

1.05 DELIVERY, STORAGE, AND PROTECTION

- A. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with conditions at site.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- E. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- F. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- G. Arrange storage in a manner to provide easy access for inspection.
- H. Maintain storage conditions to prevent deterioration or damage.
- I. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- J. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- K. Handle products by methods to prevent bending or overstressing.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Stainless Steel Metallic Ball Valve:
 - 1. Apollo.
 - 2. Jamesbury.
 - 3. Nibco.
 - 4. Milwaukee.
 - 5. Engineer approved equivalent
- B. Plastic Ball Valve
 - 1. Nibco.
 - 2. Hayward Plastics.
 - 3. ASAHI/America.
 - 4. Chemtrol.
 - 5. Engineer approved equivalent

2.02 METALLIC BALL VALVE (1/2 IN TO 3 IN DIAMETER)

- A. General:
 - 1. Solder or threaded ends with union.
 - 2. Rated for 400 psi and 250 degF.
 - 3. Stuffing boxes capable of being repacked under pressure and adjustable for wear.
 - 4. Ball design which does not allow media contact with stem.
- B. Body: 316 SS.
- C. Ball: 316 SS.
- D. Seat and struffing box ring: Teflon
- E. Lever handle showing direction of opening.

2.03 PLASTIC BALL VALVE (1/2 IN TO 4 IN DIAMETER)

- A. General:
 - 1. For use with PVC or CPVC piping.
 - 2. Double or true union design.
 - 3. Rated for 150 psi and 75 degF.
 - 4. Stuffing boxes capable of being repacked under pressure and adjustable for wear.
 - 5. Blocks both directions, upstream and downstream. Capable of being disconnected at downstream end at full line pressure.
- B. Body: PVC.
- C. Ball: PVC.
- D. Seat: Teflon.
- E. Lever handle showing direction of opening.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions as shown on the plans by qualified craftsmen.
- B. Location, orientation, and quantities as shown on the plans.
- C. Include all required related items necessary for a complete installation.
- D. Surface preparation shall follow the piping surface preparation specification. Contractor shall be responsible for compatibility of manufacturer's shop coating and final finish.
- E. Install valve seat level.

3.02 MISCELLANEOUS VALVE SCHEDULE

- A. A separate valve schedule will not be provided for miscellaneous valves. The Contractor shall be responsible for reviewing all drawings, details, and specifications to identify and account for all required miscellaneous valves, including but not limited to plant effluent water valves and polymer solution valves. The Contractor shall determine the quantity, size, type, and material of each valve based on this specification section and the requirements of the piping system and associated equipment. Any omissions or discrepancies shall be brought to the attention of the Engineer prior to ordering materials. Failure to account for required valves shall not be cause for additional compensation.

END OF SECTION 22 0523.50

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SECTION 22 0523.60
VALVE AND GATE OPERATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Valve and Gate Operators.

1.02 REFERENCES

- A. AWWA C507 - Ball Valves, 6 In. Through 60-In. (150 mm Through 1,500 mm).
- B. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.
- C. AWWA C517 - Resilient-Seated Cast-Iron Eccentric Plug Valves.
- D. AWWA C540 - Power-Actuating Devices for Valves & Slide Gates.
- E. AWWA C542 - Electric Motor Actuators for Valves and Slide Gates.
- F. AWWA C550 - Protective Interior Coatings for Valves and Hydrants.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit the following as appropriate for each valve provided:
 - 1. Outline and installation drawings for equipment and fixtures furnished.
 - 2. Equipment performance data and operating characteristics.
 - 3. Manufacturer's catalog data, marked to indicate materials being furnished as standard equipment, fixtures, specialties, and accessories.
 - 4. Shop Drawings on shop-fabricated systems.
 - 5. Drawings showing arrangement of piping, controls, and accessory equipment furnished.
- C. Manufacturer's Certificates: Certify that products of this section meet or exceed specified requirements.
- D. Operation and Maintenance Manual as described in Section 01 7800.

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with conditions at site.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- E. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- F. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- G. Arrange storage in a manner to provide easy access for inspection.
- H. Maintain storage conditions to prevent deterioration or damage.
- I. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- J. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- K. Handle products by methods to prevent bending or overstressing.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and to sign Certificate of Proper Inspection attached to Section 01 4000.
- B. Include manufacturer's representative startup and training time as required in individual valve specification sections.
- C. Any additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 VALVE AND GATE OPERATORS

- A. General:
 - 1. Operator (actuator) types for each valve or gate are as shown on the drawings and valve schedule.
 - 2. The rated torque capability of each operator shall be sufficient to seat, unseat, and rigidly hold, in any intermediate position, the valve disc it controls under the operating conditions specified.
 - 3. Valve actuators shall be equipped with adjustable mechanical stop-limiting devices to prevent over-travel of the valve disc in the open and closed positions.
 - 4. Actuator housings, supports, and connections to the valve shall be designed with a minimum safety factor of 5, based on the ultimate strength of materials used.
 - 5. The actuator shall be designed to control the valve in all positions from fully open to fully closed and from fully closed to fully open with control in any intermediate position.
 - 6. Valves and operators shall be furnished as complete assemblies.
 - 7. The valve manufacturer shall provide and take full responsibility for sizing all valve operators to be compatible with the valves shown on the drawings and valve schedule. For valves without extension-bonnets or torque tubes, floor stands shall be leak tested and cycled after installation of the operator.
 - 8. All operators shall be by the same manufacturer.
 - 9. Coating: Buried valves shall have manufacturer's standard exterior asphalt or epoxy coating. Above-grade valves shall have manufacturer's standard exterior primer, compatible with epoxy field coating as per Section 09 9000.
 - 10. Operators shall meet the full requirements of AWWA C507, AWWA C509, AWWA C517, AWWA C540, AWWA C542, and AWWA C550 for the designated pressure class and service conditions, and the following requirements.
- B. Manual Operators:
 - 1. Manual operators shall meet the full requirements of AWWA C550 and the following.
 - 2. Handwheel Operator:
 - a. Provide handwheels for gate valves, knife gate valves, butterfly valves, plug valves, and globe valves.
 - 1) Sized in accordance with AWWA C550.
 - b. Provide lever actuators for plug valves, butterfly valves and ball valves, above grade, 6 inch and smaller in diameter unless otherwise noted in the Valve Schedule. Pointer shall indicate valve position.
 - c. To be used when centerline of valve is less than 6' above finished floor elevation.
 - d. Cast iron housing and handwheel, wide gripping area, with arrow to indicate opening direction.
 - e. Bronze thrust and sleeve bearings on the operating shaft, adjustable open and closed position stops.

- f. Counterclockwise to open, valve position indicator.
 - g. Size of handwheel shall be the largest nominal size that will fit at each valve location and operator orientation.
 - h. Valve manufacturer and Contractor shall be responsible for properly sizing all handwheels for each valve application and location.
- 3. Chainwheel Operators:
 - a. To be used when centerline of valve is greater than 6' above finished floor elevation.
 - b. Other requirements shall be same as handwheel operators; supply adequate length of rustproof chain to reach from valve location to within 3 feet of the floor level.
 - c. Install chain bar operators for lever actuated valves with handle installed greater than 6' above operating floor.
- 4. Wrench Nut:
 - a. Wrench nuts shall be provided on all buried valves, on all valves that are to be operated through floor boxes, valves in manhole vaults, and where indicated on the drawings. Wrench nuts shall comply with AWWA C550 fitted to the top of valve stem. Counterclockwise to open.
- 5. Floor Boxes:
 - a. Openings through concrete slabs provided for key operation of valves shall be provided with a cast iron floor box complete with cover. The floor box shall be of the depth indicated on the drawings. Where the operating nut is in the slab, the stem shall have a guide to maintain the nut in the center of the box; where the nut is below the slab, the opening in the bottom of the box shall accommodate the operating key.
 - b. Each floor box and cover shall be shop coated by dipping in asphalt varnish.
- 6. Tee Wrench:
 - a. One (1) tee wrench shall be provided to operate the eccentric plug valves in manhole valve vaults. Wrench length shall be 4 feet and shall be suitable to fit the wrench nuts on the valves.
- 7. Extension Stems:
 - a. Extension stems and Stem guides shall be furnished and installed where specified, indicated on the drawings, or otherwise required for proper valve operation. Extension stems shall be of solid steel and shall be not smaller in diameter than the stem of the valve actuator shaft. Extension stems shall be connected to the valve actuator with a single Lovejoy "Type D" universal joint with grease filled protective boot. All stem connections shall be pinned.
 - b. At least two stem guides shall be furnished with each valve. Stem guides shall be of cast iron, bronze bushed, and adjustable in two directions. Stem guide spacing shall not exceed 100 times the stem diameter or 10 feet, whichever is smaller. The top stem guide shall be designed to carry the weight of the extension stem. The extension stem shall be provided with a collar pinned to the stem and bearing against the stem thrust guide.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions as shown on the plans by qualified craftsmen.
- B. Location, orientation, and quantities as shown on the plans.
- C. Include all required related items necessary for a complete installation.
- D. Install with stem between 9:00 and 3:00 position (stem shall not be inverted).
- E. Surface preparation shall follow the piping surface preparation specification. Contractor shall be responsible for compatibility of manufacturers shop coating and final finish.
- F. Support independently or from piping.

END OF SECTION 22 0523.60

**SECTION 22 0529
HANGERS AND SUPPORTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. System of pipe supports and anchors with necessary inserts, bolts, nuts, restraining and hanger rods, washers, miscellaneous steel, and other accessories.
- B. Pipe, duct, and equipment hangers, supports, and associated anchors.
- C. Sleeves and seals.
- D. Flashing and sealing equipment and pipe stacks.

1.02 REFERENCES

- A. ANSI B31.1 - Power Piping.
- B. ASTM A36 - Standard Specification for Structural Steel.
- C. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- D. MSS SP-58 - Pipe Hangers and Supports - Materials, Design and Manufacture, Selection, Application, and Installation.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Technical data, drawings, fabrication details, and materials for each nonstandard hanger and support system proposed.
 - 2. Installation drawings and schedules for each piping system showing location and type of supports, hangers, anchors, and expansion joints.
 - a. For process-mechanical piping systems, submit installation drawings as specified in Section 22 1117.
 - b. For nonprocess-mechanical piping systems, submit installation drawings as specified in this section.
 - c. Installation drawings and schedules shall be signed by Professional Engineer registered in State of Iowa.
- C. Product Data:
 - 1. Catalog cuts and product specifications for each standard hanger and support system component proposed.
- D. Indicate hanger and support framing and attachment methods.

1.04 DESIGN REQUIREMENTS

- A. Pipe support system components shall withstand hydrostatic loads, up-lift forces, dead loads imposed by weight of pipes filled with water plus insulation, internal test pressures, and have minimum safety factor of 5.
- B. Design, detail, and installation of pipe support system not detailed on Drawings shall be Contractor's sole responsibility.
 - 1. Pipe supports detailed in Drawings shall take precedence over the general requirements of this Specification Section.
- C. Absence of pipe supports and details on Drawings shall not relieve Contractor of responsibility for providing them throughout plant.
- D. Contractor shall determine support and hanger types, sizes, locations, spacings, attachments, and anchorages for all piping systems not detailed on Drawings.
- E. A detailed support and hanger plan and schedule shall be submitted to the Engineer.

1.05 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Pre-Engineered Pipe Supports:
 - 1. Carpenter and Patterson.
 - 2. Anvil.
 - 3. Cooper B-Line.
 - 4. Engineer approved equivalent.
- B. Anchorage to concrete masonry: See Drawings and Division 05 5000 specification.
- C. Light-gauge metal framing ("struts"):
 - 1. Cooper B-Line.
 - 2. Unistrut.
 - 3. Thomas & Betts "Superstrut".
 - 4. Engineer approved equivalent.
- D. Metal Framing Systems:
 - 1. Unistrut, stainless steel.
 - 2. Fee and Mason, stainless steel.
 - 3. Engineer approved equivalent.
- E. Non-shrink grout: See Division 3 specification.

2.02 MATERIALS

- A. Hangers, rods, clamps, protective shields, metal framing, support components, and hanger accessories shall be galvanized unless otherwise noted.
- B. Hangers, rods, clamps, protective shields, metal framing, support components, and hanger accessories in treatment process, pumping, and chemical storage/feed areas and rooms shall be stainless steel or FRP.
- C. Submerged hangers, rods, clamps, protective shields, metal framing, support components, and hanger accessories in wet wells, tanks, channels or tank covers shall be Type 316 stainless steel. See Section 09 9000 for definition of submerged.
- D. MSS types indicated are typical of types and quality of standard pipe supports and hangers to be employed.
- E. Provide factory fabricated piping hangers and supports, clamps, hanger rod attachments, building attachments, saddles, shields, thrust anchorage, and other miscellaneous products of MSS SP-69 type indicated or shop fabricated supports; comply with MSS SP-58 and manufacturer's published product information. Where MSS type not indicated, provide proper selection for installation requirements and comply with MSS SP-69 and manufacturer's published product information.
- F. All piping hangers and supports in contact with stainless steel piping shall be of stainless steel construction.
- G. Provide copper plated hangers and supports for copper piping.
- H. Piping supports for vertical piping passing through floor sleeves shall be galvanized steel riser clamps.

2.03 HORIZONTAL PIPING HANGERS AND SUPPORTS

- A. Hangers for 2-1/2-inch and smaller pipe shall be split-ring, adjustable swivel, clevis, or roller type.
- B. Hangers for 3-inch pipe or greater shall be clevis or roller type.
- C. Hangers for use with spring supports shall be split-ring or clamp type.

- D. Hangers for fiberglass reinforced pipe shall be saddle type.
- E. Each hanger shall be designed to permit at least 1-1/2 inch vertical adjustment after installation.
- F. Adjustable Swivel Split-Ring Hanger: MSS Type 6.
- G. Adjustable Clevis Hanger: MSS Type 1.
- H. Adjustable Band Hanger: MSS Type 7.
- I. Adjustable Swivel-Band Hanger: MSS Type 10.
- J. Clamp: MSS Type 4.
- K. Single Roll Support: MSS Type 41, including axle roller and threaded sockets.
- L. Adjustable Roller Hanger: MSS Type 43, including axle roller and clevis.
- M. Roll/Stand: MSS Type 44, including roller, stand, and axle. MSS Type 46, including roller, adjustable.
- N. Welded Brackets: Welded fabrications complying with following.
 - 1. Light Duty: MSS Type 31.
 - 2. Medium Duty: MSS Type 32.
 - 3. Heavy Duty: MSS Type 33.
- O. Adjustable Saddle Support:
 - 1. MSS Type 38, including saddle, pipe, and reducer.
 - 2. Fabricate base support from steel pipe and include cast iron flange or welded steel plate.
- P. Stanchion Saddle Support:
 - 1. MSS Type 37, including saddle and U-bolt.
- Q. Strap or wire hangers not acceptable.
- R. All cross bolts on hangers, supports, and etc. shall include a lock nut or double nut.

2.04 VERTICAL PIPING CLAMPS

- A. 2-Bolt Riser Clamp: MSS Type 8.
- B. 4-Bolt Riser Clamp: MSS Type 42, include pipe spacers at inner bolt holes.
- C. Vertical Support: Steel riser clamp.
- D. Shield for Insulated piping 2-1/2 Inches and Larger (Except Cold Water Piping): Pipe covering protective saddles.

2.05 HANGER RODS

- A. Material:
 - 1. Steel: ASTM A36, threaded both end or continuous threaded.
- B. Rods shall conform to following sizes:
 - 1. Pipe size up to 2 in: Minimum rod diameter 3/8".
 - 2. Pipe size 2 -1/2 in. and 3 in. and 3-1/2 in: Minimum rod diameter 1/2".
 - 3. Pipe size 4 in. and 5 in: Minimum rod diameter 5/8".
 - 4. Pipe size 6 in. and 8 in: Minimum rod diameter 3/4".
 - 5. Pipe size 10 in. to 12 in: Minimum rod diameter 7/8".
 - 6. Pipe size 14 in. and over: Minimum rod diameter 1".
 - 7. Trapeze hangers as required.
- C. Nuts: All nuts on hangers shall be double nut to prevent hanger failure

2.06 INSERTS

- A. Individual Concrete Inserts: 1-5/8" wide x 1-3/8" minimum depth.
 - 1. MSS Type 18, for load under 500 pounds.
 - 2. Minimum Safe Load: 1,100 lbs.

- B. Continuous Concrete Inserts:
 - 1. Unistrut, P-3200 Series.
 - 2. Cooper B-Line, B22 or B32.
 - 3. Superstrut.
 - 4. Engineer approved equivalent.

2.07 STRUCTURAL ATTACHMENTS

- A. Turnbuckles: MSS Type 13.
- B. Weldless Eye Nut: MSS Type 17.
- C. Eye Socket: MSS Type 16.
- D. Clevis: MSS Type 14.
- E. Top Beam C-Clamp: MSS Type 19.
- F. C-Clamps: MSS Type 23, steel.
- G. Single-Side Clamp: MSS Type 25.
- H. Top I-Beam Clamp: MSS Type 25.
- I. Side Beam Clamp: MSS Type 20.
- J. Concrete Anchors:
 - 1. Minimum-Safety Factor: 5.

2.08 SADDLES AND SHIELDS

- A. Protection Saddles: MSS Type 39.
- B. Protection Shields: MSS Type 40.

2.09 FLASHING

- A. Metal Flashing: 26 gauge galvanized steel.
- B. Lead Flashing: 5 lb/sq. ft. sheet lead for waterproofing; one lb/sq.ft. sheet lead for soundproofing.
- C. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.
- D. Caps: Steel, 22 gauge minimum; 16 gauge at fire resistant elements.

2.10 SLEEVES

- A. Sleeves for Pipes Through Non-Fire Rated Floors: Form with 18 gauge galvanized steel.
- B. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated sleeves including seals, UL listed.
- C. Sleeves for pipes through non-fire rated beams, walls, footings, and potentially wet floors, form with steel pipe.
- D. Sleeves for Round Ductwork: Form with galvanized steel.
- E. Sleeves for Rectangular Ductwork: Form with galvanized steel incorporated in spec link
- F. Fire Stopping Insulation: Glass fiber type, non-combustible. 3M CP25 caulk and FS195 Wrap/Strip or equal.
- G. Caulk: Acrylic sealant.

2.11 MISCELLANEOUS MATERIALS

- A. Shop-Fabricated Anchors and Supports:
 - 1. Steel Plates, Shapes, and Bars: ASTM A36.
 - 2. Restraining Rods: ASTM A307.
 - 3. Fabricate in accordance with Division 5 specification.
- B. Concrete and non-shrink grout: in accordance with drawings details and Division 3 specification

- C. Concrete anchorage (anchor bolts, adhesive anchors, expansion anchors, etc.): See Division 5 specs and Structural Drawings.

2.12 FABRICATION

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Design hangers to be adjustable or removable without disengagement of supported pipe.

PART 3 EXECUTION

3.01 GENERAL

- A. Install hangers, supports, clamps, and attachments from building structure; comply with MSS SP 69. Group parallel runs of horizontal piping to be supported together on trapeze type hangers where possible.
- B. Install supports to provide indicated pipe slopes and so that maximum pipe deflections allowed by ANSI B31.1 are not exceeded.
- C. Except as otherwise indicated for exposed continuous pipe runs, install hangers and supports of same type and style as installed for adjacent similar piping.
- D. Install supports to allow controlled movement of piping systems, permit freedom of movement between pipe anchors, and facilitate expansion loops, expansion bends, and action of expansion joints, similar units.
- E. Piping shall be free to move when piping expands or contracts, except where fixed anchors are indicated. Where adequate hanger rod swing length cannot be provided or where pipe movement based on expansion of 1 inch/100 feet for each 100°F change in temperature exceed 1/2 inch, provide approved roller supports.
- F. Support piping 2 inch and larger on trapeze hangers on rollers.
- G. Prevent contact between dissimilar metals. Where concrete or metal pipe support is used, place 1/8 inch thick, teflon, neoprene rubber or plastic strip under piping at point of bearing. Cut to fit entire area of contact between pipe and support.
- H. Apply anti-seize compound to nuts and bolts.
- I. Hangers and supports which require a cross bolt (or spacer) shall include a lock nut or double nut.

3.02 INSTALLATION

- A. Support piping from structural framing, unless otherwise noted. Do not support piping from other piping.

3.03 INSERTS

- A. Locate inserts so total load on insert does not exceed manufacturer's recommended maximum load. Location of inserts shall be approved by Engineer.
- B. Where necessary to anchor supports to hardened concrete or completed masonry, use concrete anchors.
- C. Inserts shall be placed in forms by this contractor.
- D. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- E. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- F. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.
- G. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.04 PIPE HANGERS AND SUPPORTS

- A. Support horizontal steel piping as follows:

1. Pipe Size: 1/2 inch - Maximum Hanger Spacing: 5'-0".
 2. Pipe Size: 3/4 inch - Maximum Hanger Spacing: 6'-0".
 3. Pipe Size: 1 inch - Maximum Hanger Spacing: 7'-0".
 4. Pipe Size: 1-1/2 inch - Maximum Hanger Spacing: 9'-0".
 5. Pipe Size: 2 inch - Maximum Hanger Spacing: 10'-0".
 6. Pipe Size: 2-1/2 inch - Maximum Hanger Spacing: 11'-0".
 7. Pipe Size: 3 inch - Maximum Hanger Spacing: 12'-0".
 8. Pipe Size: 3-1/2 inch - Maximum Hanger Spacing: 13'-0".
 9. Pipe Size: 4 inch - Maximum Hanger Spacing: 14'-0".
 10. Pipe Size: 5 inch - Maximum Hanger Spacing: 16'-0".
 11. Pipe Size: 6 inch - Maximum Hanger Spacing: 17'-0".
 12. Pipe Size: 8 inch - Maximum Hanger Spacing: 19'-0".
 13. Pipe Size: 10 inch and over - Maximum Hanger Spacing: 22'-0".
- B. Support horizontal plastic piping (Schedule 80 at 100 degrees F) as follows:
1. Pipe Size: 1/2 inch - Maximum Hanger Spacing: 4'-6".
 2. Pipe Size: 3/4 inch - Maximum Hanger Spacing: 4'-6".
 3. Pipe Size: 1 inch - Maximum Hanger Spacing: 5'-0".
 4. Pipe Size: 1-1/2 inch - Maximum Hanger Spacing: 5'-6".
 5. Pipe Size: 2 inch - Maximum Hanger Spacing: 6'-0".
 6. Pipe Size: 3 inch - Maximum Hanger Spacing: 7'-0".
 7. Pipe Size: 4 inch - Maximum Hanger Spacing: 7'-6".
 8. Pipe Size: 6 inch - Maximum Hanger Spacing: 9'-0".
 9. Pipe Size: 8 inch - Maximum Hanger Spacing: 9'-6".
 10. For plumbing applications, plastic piping shall be supported at maximum of 4'-0" spacing.
- C. Support horizontal cast iron and ductile iron as follows:
1. Pipe Size: 4 inch and smaller - Maximum Hanger Spacing: 5'-0".
 2. Pipe Size: 6 inch to 12 inch - Maximum Hanger Spacing: 12'-0".
 3. Pipe Size: Larger than 12 inch - Maximum Hanger Spacing: 16'-0".
 4. For plumbing applications, support horizontal cast iron and ductile iron piping adjacent to each hub, with maximum of 5'-0" spacing between hangers.
- D. Attach to structural steel with beam clamps.
- E. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- F. Place a hanger within 12 inches of each horizontal elbow.
- G. Use hangers with 1-1/2 inch minimum vertical adjustment.
- H. Where piping of various sizes is to be supported together, space supports for smallest pipe size or install intermediate supports for smaller diameter pipe.
- I. Provide minimum of 2 pipe supports for each pipe run.
- J. Where piping connects to equipment, support by pipe support and not equipment, unless approved by equipment manufacturer.
- K. Provide pipe supports on each side of instruments and other devices.
- L. Unless otherwise shown or authorized by Engineer, place piping running parallel to walls approximately 1-1/2 inches out from face of wall and at least 3 inches below ceiling.
- M. Pedestal pipe supports shall be adjustable with stanchion, saddle, and anchoring flange.
- N. Pedestal or floor supports shall have a grout pad.
- O. Support piping in manner preventing undue strain on valves, fittings, or equipment. Provide pipe supports at changes in direction or elevation, adjacent to flexible couplings, adjacent to nonrigid joints, and where otherwise shown. Do not install pipe supports and hangers in equipment access areas or bridge crane runs.

- P. Stacked horizontal runs of piping along walls may be supported by metal framing system attached to concrete insert channels.
- Q. Paint hangers, clamps, protective shields, metal framing support components, and hanger accessories in accordance with Section 09 9000.
- R. Support vertical piping at every other floor. Support vertical cast iron pipe at each floor at hub.
- S. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- T. Support riser piping independently of connected horizontal piping.

3.05 THRUST ANCHORS

- A. For suspended piping, center thrust anchors as closely as possible between expansion joints and between elbows and expansion joints. Anchors shall hold pipe securely and be sufficiently rigid to force expansion and contraction movement to take place at expansion joints or elbows and preclude separation of joints.
- B. Provide thrust anchors as required to resist thrust due to changes in diameter or direction or dead-ending of pipe lines. Anchorage shall be required wherever bending stresses exceed allowable for pipe. Wall pipes may be used as thrust anchors.
- C. Restraining rod size and number shall be as shown on Drawings.

3.06 INSULATED PIPING

- A. Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed allowable pipe stresses.
- B. Where low compressive strength insulation or vapor barriers are indicated on cold water piping, install coated protective shields. For pipe 8 inch and over, install wood insulation saddles.
- C. Where insulation without vapor barrier is indicated, install protection saddles on piping 2 inches and larger.

3.07 EQUIPMENT BASES AND SUPPORTS

- A. Concrete bases will be provided by others. The contractor shall provide dimensions.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members or steel pipe and fittings. Brace and fasten with flanges bolted to structure. See Contract Drawings for type of support.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.08 FLASHING

- A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting above finished roof surface with lead worked one inch minimum into top of pipe, 8 inches minimum clear on sides with 24 x 24 inches sheet size. for pipes through outside walls, turn flanges back into wall and caulk, metal counterflash and seal.
- C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- D. Seal floor, shower, or floor sink drains watertight to adjacent materials with sheet lead flashing.
- E. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.
- F. Refer to Section 23 3423 for additional requirements for mechanical roof installations.

3.09 SLEEVES

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.

- B. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.
- C. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with fire stopping insulation and caulk seal air tight. Provide close fitting metal collar or escutcheon coves at both sides of penetration.
- D. Install chrome plated steel escutcheons at finished surfaces.

END OF SECTION 22 0529

**SECTION 22 0533
HEAT TRACING FOR PLUMBING PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Self-regulating parallel resistance electric heating cable.
- B. Cable outer jacket markings.
- C. Connection kits.
- D. Accessories.
- E. Controls.

1.02 REFERENCE STANDARDS

- A. IEEE 515.1 - IEEE Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Trace Heating for Commercial Applications.
- B. ITS (DIR) - Directory of Listed Products.
- C. NFPA 70 - National Electrical Code.
- D. UL (DIR) - Online Certifications Directory.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.
- B. Coordinate the work with other trades to provide ground fault protection for electric heat tracing circuits as required by NFPA 70.
- C. Coordinate the work with other trades to provide circuit breaker ratings suitable for installed circuit lengths.

1.04 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Provide data for electric heat tracing.
- C. Shop Drawings: Indicate electric heat tracing layout, electrical terminations, thermostats, controls, and branch circuit connections.
- D. Manufacturer's Installation Instructions: Indicate installation instructions and recommendations.
- E. Field Quality Control Submittals: Indicate test reports and inspection reports.
- F. Project Record Documents: Record actual locations of electric heat tracing lines and thermostats.
- G. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions of equipment and controls, maintenance and repair data, and parts listings.
- H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide two year manufacturer warranty for cables, connection kits, accessories, and controls.

PART 2 PRODUCTS

2.01 SELF-REGULATING PARALLEL RESISTANCE ELECTRIC HEATING CABLE

- A. Manufacturers:
 - 1. Chromalox, Inc
 - 2. nVent Raychem
 - 3. Pentair
 - 4. Thermon Manufacturing Company
 - 5. Engineer Approved Equivalent.
 - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Provide products listed, classified, and labeled by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction (AHJ).
- C. Factory Rating and Testing: Comply with IEEE 515.1.
- D. Heating Element:
 - 1. Provide pair of parallel No.16 tinned or nickel coated stranded copper bus wires embedded in cross linked conductive polymer core with varying heat output in response to temperature along its length.
 - 2. Terminations: Waterproof, factory assembled, non-heating leads with connector at one end and water-tight seal at opposite end.
 - 3. Capable of crossing over itself without overheating.
- E. Insulated Jacket: Flame retardant polyolefin.
- F. Cable Cover: Provide tinned copper and polyolefin outer jacket with UV inhibitor.
- G. Maximum Power-On Operating Temperature: 150 degrees F.
- H. Maximum Power-Off Exposure Temperature: 185 degrees F.
- I. Electrical Characteristics:
 - 1. 5 W/lineal ft.
 - 2. 120 volts, single phase, 60 Hz.

2.02 CABLE OUTER JACKET MARKINGS

- A. Name of manufacturer, trademark, or other recognized symbol of identification.
- B. Catalog number, reference number, or model.
- C. Month and year of manufacture, date coding, applicable serial number, or equivalent.
- D. Agency listing or approval.
- E. Applicable environmental or area use requirements, such as NEMA 4, Type 4, IP ratings, and hazardous (classified) location markings including temperature rating.
- F. Any applicable warning/caution statements such as "WARNING: De-energize circuit before removing cover.

2.03 CONNECTION KITS

- A. Provide power connection, splice/tee, and end seal kits compatible with the heating cable and without requiring cutting of the cable core to expose bus wires.
- B. Provide with NEMA 4X rating for prevention of corrosion and water ingress.
- C. Provide UV stabilized components.
- D. Provide a visual indication of an energized heating circuit.

2.04 ACCESSORIES

- A. Provide Accessories As Indicated or As Required for Complete Installation, Including but Not Limited To:
 - 1. High temperature, glass filament tape for attachment of heating cable to metal piping.

2. Aluminum self-adhesive tape for attachment of heating cable to plastic piping.
3. Heat-conductive putty.
4. Cable ties.
5. Silicone end seals and splice kits.
6. Installation clips.
7. Warning labels for attachment to exterior of piping insulation. Refer to Section 22 0553.

2.05 CONTROLS

- A. Pipe Mounted Thermostats:
 1. Remote bulb on capillary, resistance temperature device (RTD) or thermistor for direct sensing of pipe wall temperature.
 2. Control Enclosure: Corrosion resistant and waterproof.
- B. Provide minimum 30 ampere contactor to indicate operational status and on/off control.
- C. Line sensing high-limit temperature control and high-limit alarm.
- D. Programmable Controller:
 1. Micro-processor based.
 2. Capable of four separate schedules.
 3. On/Off/Auto switch.
 4. 365 day calendar with 20 programmable holidays.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean exposed surfaces prior to installation.
- B. Prepare surfaces using approved methods as recommended by manufacturer.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's written installation instructions.
- B. Comply with installation requirements of IEEE 515.1 and NFPA 70, Article 427.
- C. Apply heating cable linearly on pipe with fiberglass tape only after piping has successfully completed any required pressure testing.
- D. Comply with applicable local building codes and requirements of authorities having jurisdiction.
- E. Grounding: Refer to Section 26 0526.
- F. Identification:
 1. After thermal insulation installation, apply external pipeline decals to indicate presence of the thermal insulation cladding at intervals not to exceed 20 ft including cladding over each valve or other equipment that may require maintenance.
- G. Equipment Wiring: Refer to Section 26 0583.
- H. Electrical Connections: Refer to Section 26 0519.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Perform start-up by factory technician or factory representative as per Owner's requirements.
- C. Field Testing and Inspections:
 1. Commission system in accordance with installation and operation manual.
 2. Inspect for sources of water entry and proper sealing.
 3. Inspect weather barrier to confirm that no sharp edges are contacting the trace heating.
 4. Insulation Resistance: Greater than 20 megohms at a test voltage of 2500 VDC for polymer insulated trace heaters.
 5. Test heating cable integrity with megohmmeter at the following intervals:
 - a. Before installing the cable.

- b. After cable has been installed onto the piping.
- c. After installing the connection kits.
- d. After the installation of thermal insulation onto the piping.
- e. Prior to initial start-up (commissioning).
- 6. Measure voltage and current at each unit.
- 7. Controls:
 - a. Verify control parameters are set to the application requirements.
 - b. Verify factory provided digital temperature controller is correctly configured with the building automation system.
- 8. Submit written test report showing values measured on each test for each cable.

3.04 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals.
- B. See Section 01 7900 - Demonstration and Training, for additional requirements.
- C. Demonstrate operation of controls.

3.05 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 22 0533

SECTION 22 0553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Stencils.
- D. Pipe markers.

1.02 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Schedules:
 - 1. Submit plumbing component identification schedule listing equipment, piping, and valves.
 - 2. Detail proposed component identification data in terms of of wording, symbols, letter size, and color coding to be applied to corresponding product.
 - 3. Valve Data Format: Include id-number, location, function, and model number.
- C. Product Data: Provide manufacturers catalog literature for each product required.
- D. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

PART 2 PRODUCTS

2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE

- A. Pipe Markers: 3/4 inch diameter and higher.

2.02 MANUFACTURERS

- A. Brady : www.bradyid.com.
- B. Seton Identification Products: www.seton.com.
- C. Champion America: www.champton-america.com.
- D. Kolbi Pipe Marker Co: www.kolbipipemarkers.com.
- E. Engineer approved equivalent.

2.03 NAMEPLATES

- A. Description: Laminated piece with up to three lines of text.
 - 1. Letter Color: Black.
 - 2. Letter Height: 1/4 inch.
 - 3. Background Color: Black.

2.04 TAGS

- A. Flexible: Vinyl with engraved black letters on light contrasting background color with up to three lines of text. Minimum tag size 1-1/2 inch in diameter.
- B. Metal: Brass, 19 gauge 1-1/2 inch in diameter with smooth edges, blank, smooth edges, and corrosion-resistant ball chain. Up to three lines of text.
- C. Chart: Typewritten letter size list in anodized aluminum frame.

2.05 STENCILS

- A. Stencil Paint: Semi-gloss enamel, colors complying with ASME A13.1.

2.06 PIPE MARKERS

- A. Comply with ASME A13.1.
- B. Flexible Marker: Factory fabricated, semi-rigid, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid conveyed.
- C. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.
- D. Underground Flexible Marker: Bright-colored continuously printed ribbon tape, minimum 6 inches wide by 4 mil, 0.004 inch thick, manufactured for direct burial service.
- E. Identification Scheme, ASME A13.1:
 - 1. Primary: External Pipe Diameter, Uninsulated or Insulated.
 - 2. Secondary: Color scheme per fluid service.
 - a. Water; Potable, Cooling, Boiler Feed, and Other: White text on green background.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive identification products.
- B. Prepare surfaces in accordance with Section 09 9000 for stencil painting.

3.02 INSTALLATION

- A. Install flexible nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install tags in clear view and align with axis of piping
- C. Apply stencil painting in accordance with Section 09 9000.
- D. Install plastic pipe markers in accordance with manufacturer's instructions.
- E. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.
- F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
- G. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with plastic or metal tags.
- H. Identify control panels and major control components outside panels with plastic nameplates.
- I. Identify thermostats relating to terminal boxes or valves with nameplates.
- J. Identify valves in main and branch piping with plastic nameplates or tags.
- K. Identify air terminal units and radiator valves with numbered tags.
- L. Tag automatic controls, instruments, and relays. Key to control schematic.
- M. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- N. Locate ceiling tacks to locate valves or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION 22 0553

**SECTION 22 0610.01
VALVE SCHEDULE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. The following is a schedule of process valves. Valves smaller than 2 inches or less for service such as polymer piping or sampling ports are not scheduled but size and type are identified on the Contract Drawings. Schedule is not intended as a bill of materials but rather as an aid to construction.
- B. Unless otherwise shown on drawings or schedules, provide the following valves, subject to the requirements of the individual specifications.

1.02 DESCRIPTION

- A. In the following valve schedule, below each valve number, the type of service, the valve size and comments about the individual valve are described.
- B. See Division 22 for individual valve specifications.

PART 2 VALVE SCHEDULE

2.01 SCHEDULE ON FOLLOWING PAGES.

END OF SECTION 22 0610.01

VALVE SCHEDULE								
Tag No.*	Location	Line**		Valve Type	Spec. Section	Mounting	Actuator Type	Comments
		Size (IN)	Designation					
Digester Control Building Basement								
PV-1045	Digester Transfer Pump - Suction Isolation	6"	DS	PV	22 0523.15, 22 0523.60	FL	Handwheel	
Yard								
PV-1055	Yard Piping - Plug Valve	8"	DS	PV	22 0523.15, 22 0523.60	FL	Wrench Nut w/ Extension Stem	Located in valve vault MH
PV-1310	Sludge Storage Tanks - Plug Valve	12"	TS	PV	23 0523.15, 22 0523.60	FL	Wrench Nut w/ Extension Stem	Located in valve vault MH
PV-1320	Sludge Storage Tank no. 4 - Plug Valve	12"	TS	PV	24 0523.15, 22 0523.60	FL	Wrench Nut w/ Extension Stem	Located in valve vault MH
PV-1330	Sludge Storage Tanks no. 5&6 - Plug Valve	12"	TS	PV	25 0523.15, 22 0523.60	FL	Wrench Nut w/ Extension Stem	Located in valve vault MH
RDT Building								
PV-1114	WAS RDT Feed - Influent Plug Valve	6"	WAS	PV	22 0523.15, 22 0523.60	FL	Handwheel	
PV-1116	WAS or Digested Sludge Feed near RDT #1 - Plug Valve	6"	WAS	PV	23 0523.15, 22 0523.60	FL	Handwheel	
CV-1153	TWAS Pump - Discharge Check Valve	6"	TWAS	CV	22 0523.12, 22 0523.60	FL	N/A	
PV-1154	TWAS Pump - Discharge Plug Valve	6"	TWAS	PV	22 0523.15, 22 0523.60	FL	Handwheel	
PV-1214	Digested Sludge RDT Feed - Plug Valve	6"	DS	PV	24 0523.15, 22 0523.60	FL	Handwheel	
PV-1218	Digested Sludge Feed - Plug Valve	6"	DS	PV	26 0523.15, 22 0523.60	FL	Handwheel	
CV-1253	TS Pump - Discharge Check Valve	6"	TS	CV	22 0523.12, 22 5023.60	FL	N/A	
PV-1254	TS Pump - Discharge Plug Valve	6"	TS	PV	22 0523.15, 22 0523.60	FL	Handwheel	Vertical Orientation
PV-1256	TWAS/ Thickened Sludge Discharge - Plug Valve	6"	TWAS/TS	PV	23 0523.15, 22 0523.60	FL	Chainwheel	Vertical Orientation
PV-1257	TS Discharge - Plug Valve	6"	TS	PV	24 0523.15, 22 0523.60	FL	Chainwheel	
NOTE: MECHANICAL AND PLUMBING VALVES 2" AND LESS ARE NOT SHOWN.								
KEY								
* Valve Designation		Diameter: Nominal Pipe Diameter			** Pipe Designation			
PV	Plug Valve				RDTP	Rotary Drum Thickener Polymer		
CV	Check Valve				WAS	Waste Activated Sludge		
		Mounting:			TWAS	Thickened Waste Activated Sludge		
		FL	Flange		DS	Digested Sludge		
		NPT	Threaded		TS	Thickened Sludge		

**SECTION 22 0719
PLUMBING PIPING INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cellular glass insulation.
- B. Glass fiber insulation.
- C. Jacketing and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- C. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
- D. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation.
- E. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
- H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.05 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.02 GLASS FIBER INSULATION

- A. Manufacturers:
 - 1. CertainTeed Corporation
 - 2. Johns Manville Corporation
 - 3. Knauf Insulation
 - 4. Owens Corning Corporation
 - 5. Engineer approved equivalent

- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm.
- D. Vapor Barrier Lap Adhesive: Compatible with insulation.

2.03 CELLULAR GLASS INSULATION

- A. Manufacturers:
 - 1. Owens Corning Corporation: FOAMGLAS
- B. Insulation: ASTM C552, Type II, Grade 6.
 - 1. K Value: 0.35 at 100 degrees F.
 - 2. Service Temperature Range: From 250 degrees F to 800 degrees F.
 - 3. Water Vapor Permeability: 0.005 perm inch maximum per inch.
 - 4. Water Absorption: 0.5 percent by volume, maximum.
 - 5. Density: A minimum of 6.12 pcf.

2.04 JACKETING AND ACCESSORIES

- A. PVC Plastic Jacket:
 - 1. Manufacturers:
 - a. Johns Manville/Zeston.
 - b. Engineer approved equivalent.
 - 2. Jacket: One piece molded type fitting covers and sheet material, blue color for domestic water
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil, 0.010 inch.
 - e. Connections: Brush on welding adhesive.
 - 3. Covering Adhesive Mastic: Compatible with insulation.
- B. Aluminum Jacket:
 - 1. Comply with ASTM B209/B209M, Temper H14, minimum thickness of 0.016 inch with factory-applied polyethylene and kraft paper moisture barrier on the inside surface.
 - 2. Thickness: 0.016 inch sheet.
 - 3. Finish: Smooth.
 - 4. Joining: Longitudinal slip joints and 2 inch laps.
 - 5. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
 - 6. Jacketing Sealant: Compatible with jacket and insulation.
- C. Jacketing for Direct Buried Applications
 - 1. Owens Corning Corporation; Pittwrap
 - 2. Jacket shall be compatible with the cellular glass insulation.
 - 3. Comply with ASTM C1916.
 - 4. 125 mil (3.2mm) thick water proof, heat sealable, multiple-ply laminate consisting of 3 layers of polymer modified, bituminous compound separated by glass reinforcement and aluminum foil. Outer layer of polyester film laminated to the bituminous compound.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.

- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- E. Glass fiber insulated pipes conveying fluids below ambient temperature:
 - 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 - 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- F. Glass fiber insulated pipes conveying fluids above ambient temperature:
 - 1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- G. Inserts and Shields:
 - 1. Application: Piping 2 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert Location: Between support shield and piping and under the finish jacket.
 - 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 - 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- H. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400.
- I. Neatly finish insulation at supports, protrusions, and interruptions.
- J. Exterior Applications: Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Cover with aluminum jacket. On horizontal pipe, the longitudinal joint shall be located at the 3 to 4 o'clock or 8-9 o'clock position and the joint opening shall point downward in order to shed water. On vertical pipe, each higher jacketing piece shall overlap the piece below it at joints in order to shed water. Apply jacketing sealant per manufacturer's recommendations.
- K. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover above ground piping with aluminum jacket with seams located on bottom side of horizontal piping.

3.03 SCHEDULES

- A. Process Piping:
 - 1. Heat Traced Thickened Sludge and Digested Sludge Piping where shown above ground on sheet P.100 and P.201 down to 5'-0" below grade.
 - a. 2" thick cellular glass insulation
 - 1) Exterior above ground jacket:
 - 2) Underground jacket: Pittwrap HS jacketing.
- B. Plumbing Systems:

1. Domestic Cold Water CW
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: Up to 3" inch.
 - 2) Thickness: 1 inch thickness with PVC jacket.
2. Domestic Hot Water (HW):
 - a. Glass Fiber Insulation:
 - 1) Pipe Size Range: up to 1-1/2" inch.
 - 2) Thickness: 1 inch thickness with PVC jacket.

END OF SECTION 22 0719

**SECTION 22 1005
PLUMBING PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sanitary waste piping, buried within 5 feet of building.
- B. Sanitary waste piping, above grade.
- C. Domestic water piping, above grade.
- D. Non-potable water, above grade.

1.02 REFERENCE STANDARDS

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
- C. ASTM B32 - Standard Specification for Solder Metal.
- D. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube.
- E. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings.
- F. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- G. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
- H. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
- I. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
- J. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
- K. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- L. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.
- M. NSF 61 - Drinking Water System Components - Health Effects.
- N. NSF 372 - Drinking Water System Components - Lead Content.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with the State of Iowa Standards and all local plumbing codes.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. PVC Pipe: ASTM D2665/ASTM D3034
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.03 SANITARY WASTE PIPING, ABOVE GRADE

- A. PVC Pipe: ASTM D2665.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.04 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Tube: ASTM B 88 (ASTM B 88M), Type K (A) in partitions and concealed above ceiling, Type L elsewhere, hard drawn.
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, alloy Sn95 solder.

2.05 NON-POTABLE WATER, ABOVE GRADE

- A. Pipe: PVC Schedule 80, ASTM D1785.
- B. Fittings: PVC Schedule 80, ASTM D2467.
- C. Joints: Primer meeting ASTM F 656 and a medium- or heavy-bodied solvent cement conforming to ASTM D 2564

2.06 BALL VALVES

- A. Manufacturers:
 - 1. Anvil International
 - 2. Apollo Valves
 - 3. Grinnell Products
 - 4. Nibco, Inc
 - 5. Engineer approved equivalent.
- B. Construction, 4 inch and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded or grooved ends with union.
- C. Up to 2 Inches: 2 piece bronze body, 400 psig WOG rated, stainless steel ball, Teflon seats and stuffing box ring, lever handle, solder or threaded ends with union. Provide balancing stops when used for balancing service.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges, unions, or grooved couplings.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- H. Slope water piping and arrange to drain at low points.
- I. Provide access where valves and fittings are not exposed.
- J. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum. Maintain gradients.
- K. Install valves with stems upright or horizontal, not inverted.
- L. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- M. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

3.03 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed, and clean.
- B. Ensure pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

END OF SECTION 22 1005

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**SECTION 22 1006
PLUMBING PIPING SPECIALTIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hose bibbs.

1.02 REFERENCE STANDARDS

- A. NSF 61 - Drinking Water System Components - Health Effects.
- B. NSF 372 - Drinking Water System Components - Lead Content.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.
- C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.
- D. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Accept specialties on site in original factory packaging. Inspect for damage.

1.05 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 HOSE BIBBS

- A. Manufacturers:
 - 1. Jay R. Smith
 - 2. Watts Regulator Company
 - 3. Woodford Manufacturing
 - 4. Zurn Industries
 - 5. Engineer approved equivalent.
- B. Interior Hose Bibbs:
 - 1. Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome plated where exposed with handwheel, integral vacuum breaker or backflow prevention in conformance with ASSE 1011.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

END OF SECTION 22 1006

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**SECTION 22 1116
DUCTILE IRON PIPE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Detailed requirements for various ductile iron piping products. Some products specified in this section may not be required for this Contract. Piping system Specification section(s) and Drawings identify particular ductile iron piping products to be provided under this Contract.

1.02 REFERENCES

- A. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- B. ASTM B1000 - Standard Practices for Casting Preparation and Test Procedure of Porcelain Enamel-Lined Pipe, Fittings, and Valves for Use in the Municipal Wastewater, Sewage, and Water Treatment Industry.
- C. ASTM C283 - Standard Test Methods for Resistance of Porcelain Enameled Utensils to Boiling Acid.
- D. ASTM D792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
- E. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
- F. AWWA C105 - Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
- G. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 in. Through 48 in., for Water and Other Liquids.
- H. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Pressure Pipe and Fittings.
- I. AWWA C115 - Flanged Ductile-Iron Pipe with Threaded Flanges.
- J. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
- K. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
- L. AWWA C153 - Ductile-Iron Compact Fittings, 3 inch Through 16 inch, for Water or Other Liquids.
- M. AWWA C606 - Grooved and Shouldered Joints.
- N. ANSI A21.14 - Ductile-Iron Fittings 3-in. Through 24-in., for Gas.
- O. ANSI A21.52 - Ductile-Iron Pipe, Centrifugally Cast, In Metal Molds or Sand Lined Molds for Gas.
- P. ANSI B18.2.1 - Square and Hex Bolts and Screws Inch Series.
- Q. ANSI B18.2.2 - Square and Hex Nuts.
- R. AWS A5.6 - Specification for Covered Copper and Copper Alloy Arc Welding Electrodes.
- S. AWS A5.15 - Specification for Welding Electrodes and Rods for Cast Iron.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01 3000.
- B. Product Data: Include Manufacturer's specifications, catalog cuts, and literature:
 - 1. Pipe.
 - 2. Outside coatings.
 - 3. Inside linings.
 - 4. Flanged joints.
 - 5. Standard fittings.
 - 6. Special fittings.
 - 7. Wall pipe and floor pipe.
- C. Submit outside coating system for buried, interior, exterior, and submerged piping locations. Include submittal information specified in Section 09 9000.

- D. Submit product data and coating system information specified above in one complete submittal.
- E. Shop Drawings showing layout for ductile iron piping systems shall be submitted in accordance with and transmitted under appropriate piping system specification section.
- F. A letter from the pipe and fitting manufacturers stating the product(s) are supplied new from the manufacturer and all linings required by the specifications for the pipe and fittings are supplied by the manufacturer and are covered by the manufacturer's warranty.

1.04 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Liquid and Air Service Pipe: AWWA C151, ductile iron.
- B. Minimum Thickness Class:
 - 1. Flanged Joint Pipe: Thickness Class 53.

2.02 INSIDE LINING

- A. Ceramic Epoxy 40-60 mil thickness, Protecto 401, SP-2000, Permox-CTF, or Engineer approved equivalent, or as noted in pipeline schedule. Manufacturer shall provide testing report for lining materials including results of holiday test using no less than 62.5 volts per mil.

2.03 JOINTS

- A. Joint Type:
 - 1. Liquid piping shall be flanged end joint.
 - 2. As shown on Drawings if different than specified above for services and locations.
- B. Flanged Joints:
 - 1. Flanged pipe for liquid and air service shall be in accordance with AWWA C115.
 - 2. Flanged pipe for gas service shall be in accordance with AWWA C115 and ANSI A21.52. In addition to pipe marking specified in AWWA C115 and ANSI A21.52, conspicuously stamp each flanged pipe with words "AIR TESTED".
 - 3. Fabrication of flanged pipe, including assembly of flange on pipe shall be performed by pipe manufacturer in accordance with AWWA C115. Assembly of flange on pipe outside of manufacturer's shop is unacceptable.
 - 4. Flange material for flanged pipe shall be ductile iron. Flanged pipe with gray iron flanges is not acceptable.
 - 5. Gasket material shall be suitable for service and maximum operating temperature of piping system as specified in Piping System Specification Section 40 0620. Torque requirement of gaskets shall be less than torque rating of flange, bolts, and nuts.
 - 6. Gaskets shall be full face, 1/8 inch thick, and conform to dimensions shown in Appendices to AWWA C110 and C115.
 - 7. Bolts:
 - a. Size, length, and number as shown in AWWA C110 and C115.
 - b. Material: 304 Stainless steel, ASTM A193, Grade 8.
 - c. Dimensions: ANSI B18.2.1, heavy hex.
 - 8. Nuts:
 - a. Size, length, and number as shown in AWWA C110 and C115.
 - b. Material: 304 Stainless steel, ASTM A193, Grade 8.
 - c. Dimensions: ANSI B18.2.2, heavy hex.
 - 9. Contractor to apply anti-seize compound to nuts and bolts

2.04 FITTINGS

- A. Pressure rating shall be 250 psi, minimum.

- B. Standard fittings for liquid and air service shall be as follows:
 - 1. Flanged Joint Fittings:
 - a. Ductile iron.
 - b. AWWA C110.
 - c. Flange dimensions in accordance with AWWA C115.
- C. Special fittings for liquid and air service, not included in AWWA standards, shall be manufacturer's standard, based on AWWA design principles, and in compliance with applicable requirements of AWWA standards.
- D. Wall Pipe and Floor Pipe:
 - 1. Ductile iron.
 - 2. Wall thickness of body equal to or greater than wall thickness of connecting pipe.
 - 3. Flanges set flush with face of concrete shall be tapped for stud bolts.
 - 4. Collar dimensions as shown on Drawings.
 - 5. Collar cast integral with pipe or fabricated by welded attachment of collar to pipe.
 - 6. Fabricated wall pipe and floor pipe shall be as follows.
 - a. Rated for dead end thrust due to 250 psi internal pressure.
 - b. Ductile iron collar welded continuously around pipe on both sides of collar.
 - c. Weld in pipe manufacturer's shop by qualified welder.
 - d. Electrodes: AWS A5.15, Class ENiFe-CI or AWS 5.6, Class ECuAl-2.

2.05 OUTSIDE COATING

- A. Buried piping shall be provided with asphaltic coating approximately 1 mil thick in accordance with applicable AWWA and ANSI standards.
- B. Surface preparation, priming, and finish coating of non-buried piping shall be compatible and in accordance with Section 09 9000, System 3. Non-buried piping shall not have the asphaltic coating, but shall be provided with the specified shop prime coat.
- C. Surface preparation, priming, and finish coating of piping for submerged and splash areas shall be compatible with Section 09 9000, System 21, suitable for potable water use. Submerged/splash area piping shall not have the asphaltic coating, but shall be provided with the specified shop prime coat.
- D. Finish color for interior and exterior piping shall be as specified in Section 09 9000.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Process Piping: In accordance with Section 22 1117.

3.02 JOINT ASSEMBLY

- A. Flanged joint in accordance with Specification Section 22 1117, flanged pipe manufacturer's written instructions, and gasket manufacturer's written instructions.

3.03 WALL PIPE

- A. Support by formwork to prevent contact with reinforcing steel.

3.04 POLYETHYLENE ENCASEMENT

- A. Install in accordance with AWWA C105 for all buried piping.

END OF SECTION 22 1116

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**SECTION 22 1116.01
PIPING ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping Accessories, including: Flange Adapters, Mechanical Joint Retainer Glands, Mechanical Joint Caps and Plugs, Mechanical Joint Tapping Sleeves and Crosses, Dismantling Joint, and Modular Casing Seals.

1.02 REFERENCES

- A. ANSI B16.5 - Pipe Flanges and Flanged Fittings.
- B. ASTM A536 - Standard Specification for Ductile Iron Castings
- C. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01 3000 - Administrative Requirements.
- B. Submit the following as appropriate for each item provided.
 - 1. Outline and installation drawings for equipment and fixtures furnished.
 - 2. Equipment performance data and operating characteristics.
 - 3. Manufacturer's catalog data, marked to indicate materials being furnished as standard equipment, fixtures, specialties, and accessories.
 - 4. Shop Drawings on shop-fabricated systems.
 - 5. Drawings showing arrangement of piping, controls, and accessory equipment furnished.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Operation and Maintenance data as described in Section 01 7800 - Closeout Submittals.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with conditions at site.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- E. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- F. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- G. Arrange storage in a manner to provide easy access for inspection.
- H. Maintain storage conditions to prevent deterioration or damage.
- I. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- J. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- K. Handle products by methods to prevent bending or overstressing.

1.05 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 PIPING ACCESSORIES

- A. Flange Adapters: Where indicated on the drawings and in these specifications. The intended use is to connect flange joint valves, fittings, and pipe to a plain end pipe. Flange joint shall match dimensions of Class 125, ANSI B16.1 and capable of being joined to Class 150, ANSI B16.5. Unless otherwise indicated, flange adapters shall have thrust protection such as set screws or anchor studs. Adapters shall be watertight at a working pressure of 150 psi. Flange adapters shall be by Series 2100 Megaflange by EBAA Iron Sales, Inc., dismantling joints with 304 SS tie rods by Viking Johnson, or Engineer approved equivalent.
- B. Floor Box: Where indicated on the drawings. Floor box shall be constructed of Cast Iron Class 30 with bronze bushing with an inside diameter 1/16" larger than the outside diameter of the stem and shall be retained with two stainless steel screws. Underside of casting shall have 2-1/2" female threads. Lid shall be bolt-down with O-Ring to seal the floor box from the top side. Provide with a packing gland to seal the floor box from the underside. Floor box shall be manufactured by Trumbull Industries or Engineer approved equivalent.
- C. Mechanical Joint Retainer Glands: Where indicated on the drawings. These glands shall be Megalug by EBAA Iron Sales, Inc., or Engineer approved equivalent.
- D. Mechanical Joint Caps and Plugs: Where indicated on the drawings. MJ caps and plugs shall be manufactured by Clow Corporation, by American Cast Iron Pipe Company, or Engineer approved equivalent.
- E. Stainless Steel Tapping Sleeves: Where indicated on the drawings. All stainless steel two-section construction with stainless steel flanged outlet for tapping valve. Stainless steel bolts and nuts. Tapping Sleeves shall be 663 as manufactured by Smith-Blair, Inc., FAST by Ford Meter Box Company, Inc., or Engineer approved equivalent.
- F. Dismantling Joints: Flanged Adapter Body: ASTM A513, ASME SA 675 GR60, or Ductile Iron ASTM A536. Steel Flange extension, bolts matching piping system. NBR Gaskets made from rubber compounded for water and sewer service in accordance with ASTM D2000 MBA810Z. Dismantling Joints shall have thrust restraint and shall be watertight at a working pressure of 150 psi. Dismantling joints shall be as manufactured by Romac, Smith-Blair, or Engineer approved equivalent.
- G. Modular Casing Seals
 - 1. Modular wall seals shall be used to secure and seal the annular space around all new sleeved and core-drilled wall penetrations. See Drawings for additional details.
 - 2. Single seals shall be provided for all sleeves and cores in walls up to 14-inches thick. Dual seals shall be provided in larger walls or where otherwise noted.
 - 3. Casing seals shall consist of modular, bolted, synthetic-rubber sealing elements. Products shall be Link-Seal manufactured by GPT Industries or Engineer approved equivalent.
 - 4. Wall sleeves and concrete core diameters shall be sized sufficiently to accommodate the modular elements.
 - 5. Contractor shall contact manufacture for proper casing seal size to work with circumstance of manhole.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installed in accordance with Manufacturer's recommendations, as shown on the plans, by qualified craftsmen.
- B. Location, orientation, and quantities as shown on the plans.
- C. Include all required related items necessary for a complete installation.
- D. Surface preparation shall follow the piping surface preparation specification. Contractor shall be responsible for compatibility of manufacturers shop coating and final finish.

- E. Support independently or from piping.

END OF SECTION 22 1116.01

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**SECTION 22 1117
PROCESS-MECHANICAL PIPING SYSTEMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section identifies process-mechanical piping systems to be provided, specifies unique requirements for each system identified, and references other sections where detailed requirements of piping components are specified.
- B. Process-mechanical piping systems are shown on Process-Mechanical Drawings and on Civil Site Piping Drawings. Civil Site Piping Drawings may also show site utility, plumbing, fire protection, and HVAC piping systems which are specified in other sections.

1.02 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

- A. Provide pipe and fittings as shown on Contract Drawings and as specified in sections identified in Process-Mechanical Piping Schedule presented in Part 3 of this section.

2.02 PIPING SUPPORT, FLEXIBILITY, THERMAL EXPANSION, AND ANCHORAGE

- A. Provide support system for each nonburied process mechanical piping system in accordance with Section 22 0529.
- B. Provide anchors, restraints, and concrete blocks as required to resist hydraulic thrust and forces due to thermal expansion.
- C. Piping shall allow for thermal expansion and contraction due to differences in operating temperatures and temperatures piping is exposed to during construction. Provide piping system products to allow for and control movement of piping due to thermal expansion and contraction.
- D. No attempt has been made to show all pipe supports, hangers, anchors, expansion joints, and other piping products required for piping support, thermal expansion, and anchorage. Absence of these products on Contract Drawings does not relieve Contractor of the responsibility for providing them in accordance with these Specifications.
- E. Provide joints, couplings, and expansion joints as shown on Contract Drawings and as required for piping flexibility. No attempt has been made to show all joints, couplings, expansion joints, and other piping products required for piping flexibility.

2.03 OTHER PIPING PRODUCTS

- A. Provide buried pipe materials and fittings in accordance with Section 33 3111.
- B. Provide piping specialties in accordance with Section 22 1116.01.

2.04 COATINGS

- A. Coat exterior surfaces of piping products with coating specified in Part 3 of this Section and in accordance with Section 09 9000.
- B. Coat piping insulation in accordance with Section 22 0719.

PART 3 EXECUTION

3.01 PREPARATION

- A. Use proper implements, tools, and facilities for safe and proper handling and protection of piping products prior to installation. Handle piping products carefully to avoid damage to products.

- B. Carefully inspect piping products before installation. Provide new, repair or recondition damaged piping products. Repair or reconditioning is subject to Engineer's approval. Patch damaged interior linings and exterior coatings or replace damaged product with new product. Patching is subject to Engineer's approval.
- C. Clean ends of piping product thoroughly before installation. Remove foreign matter and dirt from inside of piping product and keep product clean until Work has been accepted.

3.02 INSTALLATION

- A. Location:
 - 1. Install piping in accordance with arrangements shown on Contract Drawings. Install piping parallel to structure lines unless shown otherwise on Contract Drawings.
 - 2. Do not install piping through beams, columns, or other structural members unless shown otherwise on Contract Drawings.
- B. Assembly:
 - 1. Install in accordance with manufacturer's recommendations by qualified craftsmen.
 - 2. Install piping without springing or forcing in manner which would cause stress in piping, valves, or connected equipment.
 - 3. Set pipe flanges level, plumb, and aligned. Set flanged fittings so flange is true and perpendicular to pipe axis. Set flanges so bolt holes straddle vertical centerline of pipes.
 - 4. For flanged connections, match bolt holes and obtain uniform contact over entire flange area prior to installation of flange bolts. Tighten bolts to uniformly compress gaskets and minimize flange stress. Tighten bolts to torque recommended by gasket manufacturer. Coat nuts and bolts with anti-seize thread compound.
 - 5. Machine off raised-face of steel flange when mating with flat-faced flange.
- C. Pump and Equipment Connections:
 - 1. Align pipe, equipment, and pumps so stresses are not transmitted to connections. Support piping independently from pumps and equipment. Do not support piping from equipment and pumps.
 - 2. Install couplings, adapters, expansion joints, flanges, and unions so pumps, equipment, valves, and in-line instruments can be removed from service without disruption to other portions of piping system.
 - 3. For welded nozzle connections, allow for shrinkage during welding to prevent excessive stresses on pumps and equipment.
 - 4. Provide piping from pump and equipment drains and overflows to floor drain system.
 - 5. Provide control lines such as air and bubbler level system piping necessary for operation of pumps, equipment, valves, and on-line instruments.
- D. Install insulating flange, insulating coupling or dielectric union at each connection between ferrous and non-ferrous metal piping.

3.03 FIELD QUALITY CONTROL

- A. Inspect installed piping products for dents, kinks, abrupt changes of curvature, damage to lining, and other damage. Repair or recondition damaged products as approved by Engineer or replace damaged products with new products.
- B. Inspect installed, unlined piping products for corrosion and scale on interior surfaces. Clean products to remove corrosion and scale or replace with new products.
- C. Hydrostatic Test
 - 1. Provide temporary equipment for testing all pressure lines, including pump and gauges.
 - a. Test using Ashcroft Model 1082 with 4.5" dial face at 1 psi increments or equal.
 - b. Install, at Contractor's expense, corporation cocks as required at all high points in the system if necessary to completely expel all air. After all the air has been expelled, remove corporation cocks and plug or close prior to testing. Owner to determine whether the corporation cocks are removed or left in place.

2. Tests individual piping sections between valves in order to test the integrity of the valves as well as the piping. Fill each section with water and pressurize for indicated pressure and time.
 - a. Required test period is 2 hours.
 - b. Completely expel air from the system before pressurizing.
 - c. The test pressure shall be not less than 1.25 times the working pressure at the highest point along the test section and not less than 1.5 times the working pressure at the point of testing. Coordinate with Engineer for test pressure of each line.
 - d. Observe each test section for leakage at end of test period. Test fails if leakage observed or pressure drop exceeds 1 psi over 2 hours.
3. Repair all visible leaks regardless of the amount of leakage. Damaged or defective pipe, fittings, valves, or joints discovered in the pressure test shall be replaced by the Contractor and the test repeated until the test results are satisfactory. Do not use chemicals, stop-leak compounds, mastics or other temporary repair methods.
4. Drain test water from piping systems after testing and repair work complete.

3.04 CLEANING

- A. After installation and field quality control, remove dirt, rocks, debris and other foreign matter from interior of each piping system.
- B. Water flush each hydrostatically tested piping system unless specified otherwise.
 1. Flushing velocities of 2.5 feet per second shall be maintained until accumulated debris has been removed.
 2. Insert cone strainers at equipment connections prior to flushing. Remove cone strainers after flushing is complete.
 3. Remove accumulated debris through drains not less than 2 inches in diameter or by temporarily removing pipe spools, fittings, or valves.
 4. Drain piping after flushing and immediately dry piping with compressed air.
- C. Blow clean each pneumatically tested piping system with compressed air unless specified otherwise.

3.05 PROCESS MECHANICAL PIPING SCHEDULE

- A. Provide piping systems in accordance with requirements specified.
- B. Piping materials, sizes, and locations are as shown on the drawings.
- C. Color coding and banding shall be provided for non-buried piping systems. Provide color coding, banding, and labeling in accordance with Section 09 9000 and 22 0553.
- D. Schedule:
 1. WAS Feed Piping to Rotary Drum Thickeners
 - a. Type: AWWA C151, ductile iron
 - b. Diameter (nominal): 4-inch and 6-inch
 - c. Exterior Coating: See section 22 1116.
 - d. Interior Coating: See section 22 1116.
 - e. Joint Type: Flanged
 - f. Rating: Pressure Class 53
 - g. Service: Waste Activated Sludge in the RDT Building.
 2. Digested Sludge Feed Piping to Rotary Drum Thickeners (exposed)
 - a. Type: AWWA C151, ductile iron
 - b. Diameter (nominal): 6-inch
 - c. Exterior Coating: See section 22 1116.
 - d. Interior Coating: See section 22 1116.
 - e. Joint Type: Flanged
 - f. Rating: Pressure Class 53
 - g. Service: Digested Sludge in the RDT Building.

3. Digested Sludge Feed Piping to Rotary Drum Thickeners (Buried)
 - a. Type: AWWA C900 PVC.
 - b. Diameter (nominal): 6-inch
 - c. Exterior Coating: See section 33 3111.
 - d. Interior Coating: See section 33 3111.
 - e. Joint Type: See section 33 3111.
 - f. Rating: See section 33 3111.
 - g. Service: Digested Sludge.
4. Digested Sludge Piping surrounding the Digester Transfer Pump
 - a. Type: AWWA C151, ductile iron.
 - b. Diameter (nominal): 4-inch and 6-inch
 - c. Exterior Coating: See section 22 1116.
 - d. Interior Coating: See section 22 1116.
 - e. Joint Type: Flanged.
 - f. Rating: Pressure Class 53.
 - g. Service: Digested Sludge in the Digester Control Building Basement.
5. Rotary Drum Thickener Filtrate Piping:
 - a. Type: AWWA C151, ductile iron
 - b. Diameter (nominal): 4-inch, 6-inch, and 8-inch
 - c. Exterior Coating: See section 22 1116.
 - d. Interior Coating: See section 22 1116.
 - e. Joint Type: Flanged.
 - f. Rating: Pressure Class 53.
 - g. Service: Rotary Drum Thickener Filtrate in the RDT Building.
6. Thickened Waste Activated Sludge (TWAS) Piping
 - a. Type: AWWA C151, ductile iron
 - b. Diameter (nominal): 6-inch
 - c. Exterior Coating: See section 22 1116.
 - d. Interior Coating: See section 22 1116.
 - e. Joint Type: Flanged.
 - f. Rating: Pressure Class 53.
 - g. Service: Thickened Waste Activated Sludge in the RDT Building.
7. Thickened Sludge (TS) Piping (exposed)
 - a. Type: AWWA C151, ductile iron
 - b. Diameter (nominal): 6-inch
 - c. Exterior Coating: See section 22 1116.
 - d. Interior Coating: See section 22 1116.
 - e. Joint Type: Flanged.
 - f. Rating: Pressure Class 53.
 - g. Service: Thickened Sludge in the RDT Building.
8. TS Piping to Sludge Storage (Buried)
 - a. Type: AWWA C900 PVC
 - b. Diameter (nominal): 6-inch
 - c. Exterior Coating: See section 33 3111.
 - d. Interior Coating: See section 33 3111.
 - e. Joint Type: See section 33 3111.
 - f. Rating: Class See section 33 3111.
 - g. Service: Thickened Sludge.
9. Rotary Drum Thickened Polymer Piping:
 - a. Type: Schedule 80 PVC.
 - b. Diameter (nominal): 1/2-inch, 1-inch, 2-inch, and as required by RDT Polymer Feeder/Blenders Supplied.

- c. Exterior Coating: None.
- d. Interior Coating: None.
- e. Joint Type: Solvent Welded.
- f. Rating: ASTM D2665.
- g. Service: Polymer in the RDT Building.

END OF SECTION 22 1117

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**SECTION 22 4000
PLUMBING FIXTURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sinks.

1.02 REFERENCE STANDARDS

- A. NSF 61 - Drinking Water System Components - Health Effects.
- B. NSF 372 - Drinking Water System Components - Lead Content.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner 's name and registered with manufacturer.

1.04 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. Maximum Fixture or Faucet Supply Pressure: 60 psi unless stated otherwise.

2.02 SINKS

- A. Manufacturers:
 - 1. Aero Manufacturing.
 - 2. Engineer approved equivalent.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Double Compartment with Drainboard
 - 1. 14 gauge stainless steel with backsplash, two compartment 24"x24"x14" deep bowls.
 - 2. 24" drain board on right side pitched to sink.
 - 3. Full backsplash across sink compartments and drain board.
 - 4. Hemmed on edge rolls and backsplash.
 - 5. 8" oc faucet holes.
 - 6. Stainless steel legs with 1" adjustable stainless steel feet.
 - 7. Stainless steel drain basket and strainer.
 - 8. Lead free, stainless steel faucet, 12" spout, quarter turn hot and cold cartridges with cross flow prevention.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

3.02 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome-plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.

3.04 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.05 CLEANING

- A. Clean plumbing fixtures and equipment.

3.06 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.
- C. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 22 4000

SECTION 23 0553
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nameplates.
- B. Tags.
- C. Adhesive-backed duct markers.
- D. Pipe markers.

1.02 REFERENCE STANDARDS

- A. ASTM D709 - Standard Specification for Laminated Thermosetting Materials.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
- C. Product Data: Provide manufacturers catalog literature for each product required.
- D. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

- A. Fans: Nameplates.
- B. Ductwork: Nameplates.
- C. Piping: Pipe markers.
- D. Valves: Tags.

2.02 NAMEPLATES

- A. Manufacturers:
 - 1. Advanced Graphic Engraving, LLC
 - 2. Brimar Industries, Inc
 - 3. Craftmark Pipe Markers
 - 4. Kolbi Pipe Marker Co
 - 5. Seton Identification Products, a Tricor Direct Company
 - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description:
 - 1. Exterior: Stainless Steel with stamped letter filled with black coloring.
 - 2. Interior: Stainless Steel or Plastic/FRP with white text on black background.
 - 3. Mounting: Stainless Steel chain or screws.
 - 4. Letter Height: 3/8 inch, minimum.
 - 5. Plastic: Comply with ASTM D709.

2.03 TAGS

- A. Manufacturers:
 - 1. Advanced Graphic Engraving
 - 2. Brady Corporation
 - 3. Brimar Industries, Inc
 - 4. Craftmark Pipe Markers
 - 5. Kolbi Pipe Marker Co
 - 6. Seton Identification Products, a Tricor Company
 - 7. Substitutions: See Section 01 6000 - Product Requirements.

- B. Metal Tags: Stainless Steel with stamped letters; letter height minimum 3/8 inch, tag size minimum 1-1/2 inch rectangle with smooth edges.

2.04 ADHESIVE-BACKED DUCT MARKERS

- A. Manufacturers:
 - 1. Brady Corporation
 - 2. Brimar Industries Inc
 - 3. Craftmark Pipe Markers
 - 4. Kolbi Pipe Marker Co
 - 5. Seton Identification Products
- B. Material: High gloss acrylic adhesive-backed vinyl film 0.0032 inch; printed with UV and chemical resistant inks.
- C. Coordinate duct marker text and colors with Owner's standards.

2.05 PIPE MARKERS

- A. Manufacturers:
 - 1. Brady Corporation
 - 2. Brimar Industries, Inc
 - 3. Craftmark Pipe Markers
 - 4. Kolbi Pipe Marker Co
 - 5. Seton Identification Products
 - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Coordinate pipe marker text and colors with Owner's standards.
- C. Self adhesive outdoor grade vinyl labels complying with ANSI A13.1. Minimum information indicating flow direction arrow, pipe service name and abbreviation per Owner's standards.
- D. Provide arrow marker labels that wraps around entire pipe on each end of abbreviation on both sides of pipe with arrow markers pointing in flow direction.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
- C. Use tags on piping 3/4 inch diameter and smaller.
- D. Identify service and flow direction. Install in clear view and align with axis of piping. Locate identification not to exceed 25 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, at each obstruction, and at each change in direction.

END OF SECTION 23 0553

SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Testing, adjustment, and balancing of air systems.
- B. Testing, adjustment, and balancing of hydronic systems.

1.02 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems.
- C. NEBB (TAB) - Procedural Standard for Testing Adjusting and Balancing of Environmental Systems.
- D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Engineer and for inclusion in operating and maintenance manuals.
 - 2. Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
 - 3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 - 5. Units of Measure: Report data in I-P (inch-pound) units only.
 - 6. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.
 - 7. Test Reports: Indicate data on AABC MN-1 forms.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
 - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 - 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
 - 3. SMACNA (TAB).
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. TAB Agency Qualifications:
 - 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 - 2. Certified by one of the following:
 - a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
 - b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.

- c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.

D. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.02 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 - 1. Systems are started and operating in a safe and normal condition.
 - 2. Temperature control systems are installed complete and operable.
 - 3. Proper thermal overload protection is in place for electrical equipment.
 - 4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
 - 5. Duct systems are clean of debris.
 - 6. Fans are rotating correctly.
 - 7. Fire and volume dampers are in place and open.
 - 8. Air coil fins are cleaned and combed.
 - 9. Access doors are closed and duct end caps are in place.
 - 10. Air outlets are installed and connected.
 - 11. Duct system leakage is minimized.
 - 12. Hydronic systems are flushed, filled, and vented.
 - 13. Pumps are rotating correctly.
 - 14. Proper strainers are clean and in place.
 - 15. Service and balance valves are open.
- B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
- C. Beginning of work means acceptance of existing conditions.

3.03 PREPARATION

- A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Engineer to facilitate spot checks during testing.
- B. Provide additional balancing devices as required.

3.04 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 5 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 5 percent of design.
- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

3.05 RECORDING AND ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
- E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.

3.06 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

3.07 WATER SYSTEM PROCEDURE

- A. Adjust heating water systems to provide required or design quantities.
- B. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
- C. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.
- D. Effect system balance with automatic control valves fully open to heat transfer elements.
- E. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.
- F. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

3.08 SCOPE

- A. Test, adjust, and balance the following:
 - 1. HVAC Pumps.
 - 2. Heat Exchangers
 - 3. Air Coils.
 - 4. Fans.
 - 5. Air Inlets and Outlets.

3.09 MINIMUM DATA TO BE REPORTED

- A. Title Page:
 - 1. Company name
 - a. Company address
 - b. Company telephone number
 - c. Project name
 - d. Project location
 - e. Project Engineer
 - f. Project Contractor
 - g. Project altitude
- B. Pumps:
 - 1. Identification/number.
 - 2. Manufacturer.
 - 3. Size/model.
 - 4. Impeller.

5. Service.
 6. Design flow rate, pressure drop, BHP.
 7. Actual flow rate, pressure drop, BHP.
 8. Discharge pressure.
 9. Suction pressure.
 10. Total operating head pressure.
- C. Heat Exchangers:
1. Identification/number.
 2. Location.
 3. Service.
 4. Manufacturer.
 5. Model number.
 6. Primary water entering temperature, design and actual.
 7. Primary water leaving temperature, design and actual.
 8. Primary water flow, design and actual.
 9. Primary water pressure drop, design and actual.
 10. Secondary water leaving temperature, design and actual.
 11. Secondary water flow, design and actual.
 12. Secondary water pressure drop, design and actual.
- D. Heating Coils:
1. Identification/number.
 2. Location.
 3. Service.
 4. Manufacturer.
 5. Air flow, design and actual.
 6. Water flow, design and actual.
 7. Water pressure drop, design and actual.
 8. Entering water temperature, design and actual.
 9. Leaving water temperature, design and actual.
 10. Entering air temperature, design and actual.
 11. Leaving air temperature, design and actual.
 12. Air pressure drop, design and actual.
- E. Air Moving Equipment:
1. Location.
 2. Manufacturer.
 3. Model number.
 4. Air flow, specified and actual.
 5. Supply air flow, specified and actual.
 6. Total static pressure (total external), specified and actual.
 7. Fan RPM.
- F. Exhaust Fans:
1. Location.
 2. Manufacturer.
 3. Model number.
 4. Air flow, specified and actual.
 5. Total static pressure (total external), specified and actual.
 6. Inlet pressure.
 7. Discharge pressure.
 8. Fan RPM.

END OF SECTION 23 0593

**SECTION 23 0713
DUCT INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Duct insulation.
- B. Jacketing and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
- C. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
- D. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials.
- G. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section, documented experience and approved by manufacturer.

1.05 FIELD CONDITIONS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.02 GLASS FIBER, RIGID

- A. Manufacturer:
 - 1. CertainTeed Corporation
 - 2. Johns Manville
 - 3. Knauf Insulation
 - 4. Owens Corning Corp
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

- B. Insulation: ASTM C612; rigid, noncombustible blanket.
 - 1. K Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
 - 2. Foil Scrim Facing: 0.002 inch for air conditioning duct.
 - 3. Maximum Service Temperature: 450 degrees F.
 - 4. Maximum Water Vapor Absorption: 5.0 percent.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Secure with pressure-sensitive tape.
- D. Vapor Barrier Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.

2.03 JACKETING AND ACCESSORIES

- A. Weatherproof, Flexible Adhered Jacket
 - 1. Manufacturers:
 - a. Polyguard Products (Alumaguard)
 - b. Venture Clad
 - 2. Multi-ply laminate, flexible, for application to duct insulation to create a weatherproof cover.
 - 3. Exterior Finish: Aluminum, UV resistant.
 - 4. Thickness: 6 mils, minimum.
 - 5. Moisture Vapor Permeability: 0.000 perm inch, when tested in accordance with ASTM E96.
- B. Aluminum Jacket: ASTM B209
 - 1. Thickness: 0.020 inch sheet
 - 2. Finish: Embossed.
 - 3. Joining: Longitudinal slip joints and 2 inch laps
 - 4. Fittings: 0.020 inch thick die shaped fitting covers with factory attached protective liner.
 - 5. Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Test ductwork for design pressure prior to applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Exterior Applications: Provide insulation with FSK jacket. Cover with weatherproof, flexible adhered jacket.
- D. External Duct Insulation Application:
 - 1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
 - 2. Secure insulation without vapor barrier with staples, tape, or wires.
 - 3. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
 - 4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
 - 5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

3.03 SCHEDULES

- A. Exterior Supply Ducts:

1. Rigid Glass Fiber Duct Insulation: 3 inches thick with weatherproof, flexible adhered cover and aluminum outer jacket.

END OF SECTION 23 0713

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**SECTION 23 0719
HVAC PIPING INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Piping insulation.
- B. Jacketing and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 23 2113 - Hydronic Piping: Placement of hangers and hanger inserts.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.02 GLASS FIBER, RIGID

- A. Manufacturers:
 - 1. CertainTeed Corporation
 - 2. Johns Manville Corporation
 - 3. Knauf Insulation
 - 4. Owens Corning Corporation
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- C. Vapor Barrier Jacket: White kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.
- D. Vapor Barrier Lap Adhesive: Compatible with insulation.

2.03 CELLULAR GLASS

- A. Manufacturers:
 - 1. Owens Corning Corporation; FOAMGLAS:
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Pipe and Tubing Insulation: ASTM C552, Type II, Grade 6.
 - 1. K Value: 0.31 at 100 degrees F, 0.29 at 75 degrees F.
 - 2. Service Temperature Range: From 250 degrees F to 800 degrees F.
 - 3. Water Vapor Permeability: 0.005 perm inch maximum per inch.
 - 4. Water Absorption: 0.5 percent by volume, maximum.
 - 5. Density: A minimum of 6.12 pcf.

2.04 JACKETING AND ACCESSORIES

- A. PVC Plastic.
 - 1. Manufacturers:
 - a. Johns Manville Corporation

- b. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil, 0.010 inch.
 - e. Connections: Brush on welding adhesive.
 - 3. Covering Adhesive Mastic: Compatible with insulation.
- B. Aluminum Jacket:
 - 1. Comply with ASTM B209/B209M, Temper H14, minimum thickness of 0.016 inch with factory-applied polyethylene and kraft paper moisture barrier on the inside surface.
 - 2. Thickness: 0.016 inch sheet.
 - 3. Type: Factory-applied, self-adhesive jacketing.
 - 4. Finish: Smooth.
 - 5. Joining: Longitudinal slip joints and 2 inch laps.
 - 6. Fittings: 0.016 inch thick die-shaped fitting covers with factory-attached protective liner.
 - 7. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
 - 8. Jacketing Sealant: Compatible with jacket and insulation.
- C. Jacketing for Direct Buried Applications
 - 1. Owens Corning Corporation; Pittwrap
 - 2. Jacket shall be compatible with the cellular glass insulation.
 - 3. Comply with ASTM C1916.
 - 4. 125 mil (3.2mm) thick water proof, heat sealable, multiple-ply laminate consisting of 3 layers of polymer modified, bituminous compound separated by glass reinforcement and aluminum foil. Outer layer of polyester film laminated to the bituminous compound.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Test piping for design pressure, liquid tightness, and continuity prior to applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations.
- D. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- E. Glass Fiber Insulated Pipes Conveying Fluids Above Ambient Temperature:
 - 1. Provide standard jackets, with or without vapor barrier, factory-applied, or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples.
 - 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- F. Inserts and Shields:
 - 1. Application: Piping 1-1/2 inches diameter or larger.
 - 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 - 3. Insert location: Between support shield and piping and under the finish jacket.
 - 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.

- 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- G. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400.
- H. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Cover with aluminum jacket. On horizontal pipe, the longitudinal joint shall be located at the 3 to 4 o'clock or 8-9 o'clock position and the joint opening shall point downward in order to shed water. On vertical pipe, each higher jacketing piece shall overlap the piece below it at joints in order to shed water. Apply jacketing sealant per manufacturer's recommendations.

3.03 SCHEDULE

- A. Heating Systems:
 - 1. Heating Water and Glycol Supply and Return, inside building:
 - a. Less than 1-1/2" inches diameter piping: 1-1/2" thick fiberglass.
 - b. 1-1/2" and larger diameter piping: 2" thick fiberglass.
 - 2. Glycol Heating Supply and Return, outside building:
 - a. Less than 1-1/2" inches diameter piping: 2" thick fiberglass with aluminum jacket.
 - b. 1-1/2" and larger diameter piping: 2-1/2" thick fiberglass with aluminum jacket.
 - 3. Buried Heating Water Supply and Return Piping:
 - a. 3" piping: 2" thick cellular glass insulation with Pittwrap HS jacketing.

END OF SECTION 23 0719

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**SECTION 23 2113
HYDRONIC PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hydronic system requirements.
- B. Heating water piping, buried.
- C. Heating water and glycol piping, above grade.
- D. Pipe hangers and supports.
- E. Unions, flanges, mechanical couplings, and dielectric connections.
- F. Valves
 - 1. Ball valves.
 - 2. Control valves and balancing valves.

1.02 REFERENCE STANDARDS

- A. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators.
- B. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300.
- C. ASME B16.3 - Malleable Iron Threaded Fittings; The American Society of Mechanical Engineers; 1998 (R2006).
- D. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
- E. ASME B31.9 - Building Services Piping.
- F. ASTM A 120 - Pipe, Steel, Black and Hot-Dipped Zinc Coated (Galvanized), Welded and Seamless, for Ordinary Uses.
- G. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
- H. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Include data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.
- C. Welders Certificate: Include welders certification of compliance with ASME BPVC-IX.

1.04 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body.
- B. Welder Qualifications: Certify in accordance with ASME BPVC-IX.

1.05 REGULATORY REQUIREMENTS

- A. Conform to ASME B31.9 code for installation of piping system.
- B. Welding Materials and Procedures: Conform to ASME (BPV IX) .

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

1.07 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 HYDRONIC SYSTEM REQUIREMENTS

- A. Comply with ASME B31.9 and applicable federal, state, and local regulations.
- B. Piping: Provide piping, fittings, hangers, and supports as required, as indicated, and as follows:
 - 1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
 - 2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
 - 3. Grooved mechanical joints may be used in accessible locations only.
 - a. Accessible locations include those exposed on interior of building, in pipe chases, and in mechanical rooms, aboveground outdoors, and as approved by Engineer.
 - b. Use rigid joints unless otherwise indicated.
 - 4. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.
- C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges or unions to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.
- D. Valves: Provide valves where indicated:
 - 1. Provide drain valves where indicated, and if not indicated, provide at least at main shut-off, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch gate valves with cap; pipe to nearest floor drain.
- E. Welding Materials and Procedures: Comply with ASME BPVC-IX.

2.02 HEATING WATER PIPING, BURIED

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black.
 - 1. Fittings: ASTM A234/A234M, wrought steel welding type .
 - 2. Joints: Welded in accordance with AWS D1.1.
 - 3. Casing: Closed glass cell insulation.

2.03 HEATING WATER AND GLYCOL PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black, using one of the following joint types:
 - 1. Welded Joints: ASTM A234/A234M, wrought steel welding type fittings; AWS D10.12M/D10.12 welded.
 - 2. Threaded Joints: ASME B16.3, malleable iron fittings.

2.04 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
- B. Hangers for Pipe Sizes 1/2 to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
- C. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- E. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
- F. Vertical Support: Steel riser clamp.
- G. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

- H. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.05 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS

- A. Unions for Pipe of 2 Inches and Less:
 - 1. Ferrous Piping: 150 psi brass or malleable iron, threaded.
- B. Flanges for Pipe 2 Inches and Greater:
 - 1. Ferrous Piping: 150 psig forged steel, slip-on.
 - 2. Gaskets: Preformed non-asbestos type suitable for chemical and thermal conditions of piping system contents.

2.06 BALL VALVES

- A. Manufacturers:
 - 1. Anvil International
 - 2. Apollo.
 - 3. Grinnell Products
 - 4. Milwaukee Valve Company
 - 5. Engineer approved equivalent.
- B. Up to and Including 2 Inches:
 - 1. Bronze one piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder ends with union.
 - 2. Bronze two piece body, stainless steel ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder or threaded ends with union.
- C. Over 2 Inches:
 - 1. Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle, flanged.

2.07 CONTROL VALVES AND BALANCING VALVES

- A. General: Select body and trim materials in accordance with manufacturer's recommendations for design conditions and service shown. All valves shall have stainless steel shafts.
- B. Control valves shall be three-way type for modulating service as scheduled, shown, or as indicated in the sequence of operation.
- C. Close-off (differential) Pressure Rating: Valve actuator and trim shall be furnished to provide the following minimum close-off pressure ratings:
 - 1. Three-way: 300% of pressure differential between ports A and B at design flow or 100% of total system (pump) head.
- D. Three-way Modulating Service: Select pressure drop equal to the smaller of twice the pressure drop through the heat exchanger (load) or four (4) psi.
- E. 2 NPS and Smaller: Class 150 bronze or brass body with union connections, stainless steel trim, stainless steel rising stem, stainless steel disc or ball, and screwed ends with backseating capacity repackable under pressure.
- F. 2-1/2 NPS and Larger: Class 125 iron or ductile iron body, stainless steel trim, stainless steel rising stem, stainless steel disc or ball, flanged ends with backseating capacity repackable under pressure.
- G. Electronic Actuators: Direct-mounted, self-calibrating type designed for minimum 60,000 full-stroke cycles at rated torque. Actuators shall include a stroke limiting device.
- H. Provide actuator with visible position indication. Valve fail position shall be open.
- I. Proportional Signal: 0 to 10 VDC or 4 to 20 mA position feedback signal. Coordinate with makeup air unit microprocessor controller.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment using jointing system specified.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- E. After completion, fill, clean, and treat systems. See Section 23 2500 for additional requirements.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and to avoid interference with use of space.
- D. Group piping whenever practical at common elevations.
- E. Sleeve pipe passing through partitions, walls, and floors.
- F. Slope piping and arrange to drain at low points.
- G. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with Section 08 3100 .
- H. Use eccentric reducers to maintain top of pipe level.
- I. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc-rich primer to welds.
- J. Prepare unfinished pipe, fittings, supports, and accessories, ready for finish painting. See Section 09 9123.
- K. Install valves with stems upright or horizontal, not inverted.

END OF SECTION 23 2113

**SECTION 23 2114
HYDRONIC SPECIALTIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Expansion tanks.
- B. Air vents.
- C. Air separators.
- D. Strainers.
- E. Balancing valves.
- F. Glycol system.

1.02 REFERENCE STANDARDS

- A. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels.
- B. ASME (BPV VIII, 1) - Boiler and Pressure Vessel Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels; The American Society of Mechanical Engineers; 2007.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description and model.
- C. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.

PART 2 PRODUCTS

2.01 EXPANSION TANKS

- A. Manufacturers:
 - 1. Amtrol Inc
 - 2. Armstrong.
 - 3. Bell & Gossett.
 - 4. Taco, Inc
 - 5. Engineer approved equivalent.
- B. Construction: Welded steel, tested and stamped in accordance with ASME BPVC-VIII-1; supplied with National Board Form U-1, adjustable flexible EPDM diaphragm or bladder seal factory precharged to 12 psi, and steel support stand.

2.02 AIR VENTS

- A. Manufacturers:
 - 1. Armstrong International.
 - 2. Bell & Gossett.
 - 3. Taco, Inc
 - 4. Engineer approved equivalent.
- B. Manual Air Vent: Short vertical sections of 2-inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.
- C. Maximum Fluid Pressure: 150 psi.
- D. Maximum Fluid Temperature: 250 degrees F.

2.03 AIR SEPARATORS

- A. In-line Air Separators:

1. Manufacturers:
 - a. Armstrong.
 - b. Bell & Gossett.
 - c. Taco, Inc
 - d. Engineer approved equivalent.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
2. Cast iron for sizes 1-1/2 inch and smaller, or steel for sizes 2 inch and larger; tested and stamped in accordance with ASME BPVC-VIII-1; for 125 psi operating pressure.
3. Maximum Allowable Service Temperature: 450 degrees F.

2.04 STRAINERS

- A. Manufacturers:
 1. Armstrong.
 2. Grinnell Products
 3. Engineer approved equivalent.
 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Size 2 inch and Under:
 1. Provide threaded or grooved brass or iron body for up to 175 psi working pressure, Y-pattern strainer with 1/32 inch stainless steel perforated screen.
 2. Body Material by Fluid Service:
 - a. Cast Iron or Brass:
 - 1) Steam: Up to 250 psi at 450 degrees F.
 - 2) Liquids: Up to 400 psi at 150 degrees F.
- C. Size 2-1/2 inch to 4 inch:
 1. Provide flanged or grooved iron body for up to 175 psi working pressure, up to 250 degrees F working temperature, Y-pattern strainer with 1/16 inch or 3/64 inch stainless steel perforated screen.
 2. Body Material by Fluid Service:
 - a. Cast Iron:
 - 1) Steam: Up to 125 psi at 350 degrees F.
 - 2) Liquids: Up to 200 psi at 150 degrees F.
 3. Flanged iron body for 175 psi working pressure, Y pattern with 3/64 inch stainless steel perforated screen.

2.05 BALANCING VALVES

- A. Manufacturers:
 1. Armstrong
 2. Hays Fluid Controls
 3. Taco, Inc
- B. Size 2 inch and Smaller:
 1. Provide ball style with flow balancing, shut-off capabilities, memory stops, and minimum of two metering ports and NPT threaded or soldered connections.
 2. Metal construction materials consist of bronze.
 3. Non-metal construction materials consist of Teflon or EPDM.
- C. Size 2-1/2 inch and Larger:
 1. Provide ball or butterfly style with flow balancing, shut-off capabilities, memory stops, and minimum of two metering ports and flanged, grooved, or weld-end connections.
 2. Valve body construction materials consist of cast iron, carbon steel, or ductile iron.
 3. Internal components construction materials consist of brass, aluminum bronze, bronze, Teflon, EPDM, NORYL, or engineered resin.

2.06 GLYCOL SYSTEM

- A. Glycol Solution:
 - 1. Water-based solution mix containing 40 percent ethylene glycol by volume required for cooling or heating system operating temperature range.
 - 2. Cooling or heating System Operating Temperature Range: Between freezing and boiling points of -28 AND 250 degrees F at 14.7 psia.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install specialties in accordance with manufacturer's instructions.
- B. Provide manual air vents at system high points and as indicated.
- C. Provide air separator on suction side of system circulation pump and connect to expansion tank.
- D. Support pump fittings with floor-mounted pipe and flange supports.
- E. Provide relief valves on pressure tanks, low-pressure side of reducing valves, heat exchangers, and expansion tanks.
- F. Select system relief valve capacity so that it is greater than make-up pressure reducing valve capacity. Select equipment relief valve capacity to exceed rating of connected equipment.
- G. Clean and flush glycol system before adding glycol solution, see Section 23 2500.
- H. Perform tests determining strength of glycol and water solution and submit written test results.

END OF SECTION 23 2114

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**SECTION 23 2123
HYDRONIC PUMPS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. In-line pumps.

1.02 REFERENCE STANDARDS

- A. NEMA MG 1 - Motors and Generators.
- B. NFPA 70 - National Electrical Code.
- C. UL 778 - Standard for Motor-Operated Water Pumps.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide certified pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.
- C. Manufacturer's Installation Instructions: Indicate hanging and support requirements and recommendations.
- D. Operation and Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

1.04 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Armstrong Pumps, Inc.
- B. Bell & Gossett.
- C. Grundfos Pumps Corporation: www.grundfos.com/#sle.
- D. Taco Comfort Systems.
- E. Engineer approved equivalent.
- F. Substitutions: See Section 01 6000 - Product Requirements.

2.02 GENERAL

- A. Provide pumps that operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.
- B. Pumps selection shall be based on 40% ethylene glycol.
- C. Electrical Requirements:
 - 1. Listed and classified by UL or testing agency acceptable to authority having jurisdiction as suitable for the purpose specified and indicated.
 - 2. Enclosures: Provide unspecified product(s) required to fit motor:

2.03 IN-LINE PUMPS

- A. Closed-Coupled, single-stage in-line pump designed for horizontal or vertical in-line mounting; rated for discharge pressures up to 175 psi.
- B. Casing: Cast iron, with seal flush connection, threaded suction and discharge gage port, casing wear ring, drain plug, flanged suction and discharge.
- C. Impeller: Stainless steel, fully enclosed, keyed directly to motor shaft or extension.

- D. Shaft: Solid steel alloy shaft integral to motor.
- E. Seal: Mechanical seal, 225 degrees F maximum continuous duty temperature.

PART 3 EXECUTION

3.01 PREPARATION

- A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide access space around pumps for service. Provide no less than minimum space recommended by manufacturer.
- C. Provide line sized shut-off valve and strainer on pump suction, and line sized soft seat check valve and balancing valve on pump discharge.
- D. Provide air cock and drain connection on horizontal pump casings.

END OF SECTION 23 2123

**SECTION 23 3100
HVAC DUCTS AND CASINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal ducts.

1.02 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- C. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems.
- D. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems.
- E. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Indicate duct fittings, particulars such as materials, gages, sizes, welds, and configuration prior to start of work for all systems.
- C. Shop Drawings: Indicate duct fitting types, gauges, sizes, welds, and configuration.
 - 1. Submit ductwork layout drawings for the entire ductwork system, drawn at the same scale as the Contract Drawings, double line, indicating duct dimensions, fittings, accessories, elevations, clearance to structure, etc.
 - 2. Do not install ductwork without approval of shop drawings by Engineer.

1.04 REGULATORY REQUIREMENTS

- A. Construct ductwork to NFPA 90A standards.

1.05 FIELD CONDITIONS

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures within acceptable range during and after installation of duct sealants.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
- B. Duct Shape and Material in accordance with Allowed Static Pressure Range:
 - 1. Rectangular: Plus or minus 2 in-wc of stainless steel.
- C. Duct Sealing and Leakage in accordance with Static Pressure Class:
 - 1. Duct Pressure Class and Material for Common Mechanical Ventilation Applications:
 - a. Supply Air: 2 in-wc pressure class.
 - b. General Exhaust Air: 2 in-wc pressure class.
- D. Duct Fabrication Requirements:
 - 1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.

2. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
3. Construct tees, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide airfoil turning vanes of perforated metal with glass fiber insulation.
4. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
5. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.02 METAL DUCTS

- A. Material Requirements:
 1. Stainless Steel: ASTM A666, Type 304.
- B. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Comply with safety standards NFPA 90A and NFPA 90B.
- B. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- C. Duct sizes indicated are precise inside dimensions. For lined ducts, maintain sizes inside lining.
- D. Install and seal metal and flexible ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
- E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- F. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with a crimp in the direction of airflow.
- G. Use double nuts and lock washers on threaded rod supports.
- H. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- I. At exterior wall louvers, seal duct to louver frame and install blank-out panels.

END OF SECTION 23 3100

**SECTION 23 3300
AIR DUCT ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Volume control dampers.

1.02 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems.
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide for shop-fabricated assemblies including volume control dampers and hardware used. Include electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 VOLUME CONTROL DAMPERS

- A. Manufacturers:
 - 1. Cesco Products
 - 2. Greenheck
 - 3. Louvers & Dampers, Inc.
 - 4. Nailor Industries Inc.
 - 5. Pottorff Brand :
 - 6. Ruskin Manufacturing.
 - 7. Engineer approved equivalent.
- B. Fabricate in accordance with SMACNA (DCS) and as indicated.
- C. Single Blade Dampers: Fabricate for duct sizes up to 6 x 30 inch.
- D. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
- E. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- F. Quadrants:
 - 1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
 - 2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). See Section 23 3100 for duct construction and pressure class.
- B. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION 23 3300

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**SECTION 23 3423
HVAC POWER VENTILATORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof exhausters.

1.02 REFERENCE STANDARDS

- A. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program.
- B. AMCA 99 - Standards Handbook.
- C. AMCA 204 - Balance Quality and Vibration Levels for Fans.
- D. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating.
- E. UL 705 - Power Ventilators.

1.03 SUBMITTALS

- A. Product Data: Provide data on fans and accessories, including fan curves with specified operating point plotted, power, rpm, sound power levels at rated capacity, and electrical characteristics and connection requirements.
- B. Manufacturer's Instructions: Indicate installation instructions.
- C. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect motors, shafts, and bearings from weather and construction dust.

1.05 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. ACME Engineering and Manufacturing Corp
- B. Greenheck.
- C. Loren Cook Company.
- D. Penn Ventilation Companies.
- E. Twin City Fan & Blower
- F. Engineer approved equivalent.

2.02 POWER VENTILATORS - GENERAL

- A. Static and Dynamically Balanced: Comply with AMCA 204.
- B. Performance Ratings: Comply with AMCA 210, bearing certified rating seal.
- C. Sound Ratings: Comply with AMCA 301, tested to AMCA 300, bearing certified sound ratings seal.
- D. Fabrication: Comply with AMCA 99.
- E. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- F. Motors: Single phase motors shall have integral thermal overload protection.

2.03 ROOF EXHAUSTERS

- A. Product Requirements:
 - 1. Performance Ratings: Conform to AMCA 210 and bearing the AMCA Certified Rating Seal.
 - 2. Fabrication: Conform to AMCA 99.
 - 3. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- B. Fan Unit: V-belt or direct driven as indicated, with spun aluminum housing; resilient mounted motor; 1/2 inch mesh, 0.62 inch thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
- C. Roof Curb: Prefabricated, insulated welded aluminum curb with 2 inches of flashing flange and factory installed wood nailer. 24 inch
 - 1. Height: Minimum of 16" above finished roof level.
 - 2. Insulation: 1-1/2" thick, 3# density.
- D. Disconnect Switch: NEMA 4X or explosion-proof as scheduled on drawings. Factory wired, non-fusible..
- E. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked.
- F. Finish: Entire unit shall be finished with baked polyester powder coating. Color selected by Owner.
- G. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm gets attained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure roof exhausters with cadmium plated steel lag screws to roof curb.
- C. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.

END OF SECTION 23 3423

**SECTION 23 3700
AIR OUTLETS AND INLETS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Diffusers
- B. Registers/grilles

1.02 REFERENCE STANDARDS

- A. ADC 1062: GRD - Test Code for Grilles, Registers & Diffusers; Air Diffusion Council; 1984.
- B. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating.
- C. ARI 650 - Air Outlets and Inlets.
- D. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets.
- E. SMACNA (ASMM) - Architectural Sheet Metal Manual.
- F. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems; National Fire Protection Association; 1996.
- G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Carnes
- B. Krueger
- C. Price Industries
- D. Titus
- E. Tuttle and Bailey
- F. Engineer approved equivalent.
- G. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SUPPLY REGISTERS/GRILLES

- A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille with one-way deflection.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.
- C. Fabrication: Aluminum extrusions with factory clear lacquer finish. Stainless steel when installed in stainless steel ductwork or where indicated on the drawings.

2.03 EXHAUST AND RETURN REGISTERS/GRILLES

- A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, vertical face.
- B. Frame: 1-1/4 inch margin with countersunk screw mounting.
- C. Fabrication: Aluminum extrusions with factory finish. Stainless steel when installed in stainless steel ductwork.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Comply with SMACNA (ASMM) for flashing/counter-flashing of wall penetrations.
- C. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.
- D. Install diffusers to ductwork with air tight connection.
- E. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

3.02 AIR OUTLET AND INLET SCHEDULE

- A. As scheduled on project plans.

END OF SECTION 23 3700

**SECTION 23 5700
HEAT EXCHANGERS FOR HVAC**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Plate type heat exchangers.

1.02 REFERENCE STANDARDS

- A. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels.

1.03 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data: Provide data with dimensions, locations, and size of tappings and performance data.
- C. Shop Drawings: Indicate dimensions, locations, and size of tappings and performance data.
- D. Manufacturer's Instructions: Indicate installation and support requirements.
- E. Operation and Maintenance Data: Include start up and shut down instructions, assembly drawings, and spare parts lists.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect internals from entry of foreign material by temporary caps on flanged openings.

PART 2 PRODUCTS

2.01 PLATE AND FRAME TYPE HEAT EXCHANGER

- A. Manufacturers:
 - 1. Alfa Laval
 - 2. API Heat Transfer
 - 3. Bell & Gossett
 - 4. Taco Comfort Solutions
 - 5. Tranter
- B. Comply with ASME BPVC-VIII-1 for manufacture of plate and frame type heat exchangers.
- C. Frames: Carbon steel with baked epoxy enamel paint, stainless steel side bolts and shroud.
- D. Plates: Stainless steel Type 304.
- E. Gaskets: Nitrile rubber.
- F. Nozzles: 125 psi rated lined flange type.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install to permit removal of plates with minimum disturbance to installed equipment and piping.
- C. Support heat exchangers on concrete housekeeping pad.
- D. Pipe drain valves to nearest floor drain.

3.02 WATER TO WATER HEAT EXCHANGER TRIM

- A. Water Inlets and Outlets: Thermometer wells, pressure gauge tappings.
- B. Heated Water Outlet: Thermometer well for temperature regulator sensor, ASME rated pressure and temperature relief valve, valved drain; see Section 23 2114.

END OF SECTION 23 5700

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SECTION 23 7433
PACKAGED OUTDOOR MAKE-UP AIR UNITS - WATER HEAT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Make-up air unit with heating water coil.

1.02 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; National Fire Protection Association.
- B. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; National Fire Protection Association.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data with dimensions, duct and service connections, accessories, controls, electrical nameplate data, and wiring diagrams.
- C. Manufacturer's Instructions: Indicate rigging, assembly, and installation instructions.
- D. Operation And Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.
- E. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

1.04 REGULATORY REQUIREMENTS

- A. Conform to NFPA 70.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.05 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Greenheck
- B. Hastings
- C. Modine
- D. RuppAir
- E. Titan Air Corporation
- F. Engineer Approved Equivalent.

2.02 MANUFACTURED UNITS

- A. Unit: Packaged 100% outdoor air makeup air unit complete with hot water heating coil, fan, filter section, and controls.
- B. Service Conditions: The units are located in or around buildings at a wastewater treatment plant and therefore shall be suitable for ambient conditions with hydrogen sulfide present. Provide corrosion resistant temperature sensors.

2.03 FABRICATION

- A. Casing and Components: Double wall insulated construction. Steel panels, 18 gage reinforced with structural angles and channels to ensure rigidity; hinged access doors to coil, filters, controls, and blower motor assemblies.

- B. Fan Support: The fan and bearings shall be supported by a reinforced structural steel framework independent of the cabinet.
- C. Access Doors: Neoprene-gasketed doors shall be provided to allow easy service of all critical components, controls, blower, coil, filters, and fan.
- D. Outdoor Installations: Units installed outdoors shall utilize weatherproof construction, with discharge as shown on drawings..
- E. Lifting Points: Internal members shall be properly sized to allow rigging and handling of the unit by its lifting points.
- F. Finish: All cabinet surfaces inside and out shall be cleaned of oil and grease, treated with a rust-inhibiting coating. All surfaces shall be finished with a baked phenolic coating. Color to be selected by Owner and Engineer.
- G. Hot Water (Glycol) Heating Coil: Provide drainable of copper with aluminum fins, hot water heating coil. Capacities shall be as scheduled on Plans. Entire hot water heating coil including headers shall be coated with corrosion resistant electro-fin coating. Coil shall be sized for 40% ethylene glycol. Provide access to coils for service.
 - 1. Headers: Electro-fin coated seamless copper tubes with brazed joints.
 - 2. Fins: Aluminum, 9 fins per inch.
 - 3. Casing: Die formed channel frame of 16 gage galvanized steel with 3/8 inch mounting holes on 3 inch centers. Provide tube supports for coils longer than 36 inches.
 - 4. Testing: Air test under water to 200 psi for working pressure of 200 psi and 220 deg. F.
 - 5. Configuration: Drainable, with threaded plugs in headers for drain and vent; threaded plugs in return bends and in headers opposite each tube.
 - 6. Tubes: 0.025 inch thick seamless copper.
- H. Freezestat: Provide low temperature type (manual reset) freeze stat serpentine across the leaving side of the hot water coils.
- I. Insulation: Neoprene faced glass fiber insulation 1 inch thick on complete unit.
- J. Finish: Baked phenolic coating (interior and exterior) entire unit including blower.

2.04 FILTERS

- A. Filter: Removable 2 inches thick glass fiber disposable filters in metal frames. Maximum face velocity of 500 fpm.

2.05 FAN

- A. Fan: Statically and dynamically balanced centrifugal fan mounted on solid steel shaft with heavy duty self-aligning pre-lubricated ball bearings and direct or V-belt drive with matching motor sheaves and belts.

2.06 CONTROLS

- A. Controls: Pre-wire unit for connection of power supply. Field wiring from unit to remote control panel makes unit operative.
 - 1. Provide factory-installed, unit-mounted safety disconnect switch where scheduled on the Drawings.
 - 2. Provide factory-mounted 120 VAC weatherproof duplex service receptacle with unit where scheduled on the Drawings. Receptacle shall remain energized with unit safety disconnect switch in the open/off position.
- B. Remote Control Panel: Summer-winter switch, indicating lights for supply fan, clogged filter, lockout indication, hot water circulation pump operation. Panel shall not include an "Off" switch for the supply fan. Panel shall include an adjustable override thermostat that overrides the discharge air control to modulate the heating water valve to maintain temperature setpoint. Panel shall include a heavy duty alarm horn. Alarm horn shall be activated on pump failure or freezestat.
- C. Sensors: All sensors shall be stainless steel or phenolic coated.

- D. Sequence of Operation: Provide devices and controls to perform the following:
1. Winter Operation: The unit supply fan shall run continuous. The heating system includes a three-way motorized heating water control valve with a pump that circulates heating water/glycol mix. The makeup air unit shall include a microprocessor controller which will enable the circulating pump through a dry normally open contact when the outside air temperature falls below setpoint. The microprocessor shall modulate the 3-way valve to maintain the supply air temperature setpoint. The controller shall adjust the supply air temperature setpoint to satisfy the space temperature setpoint from a room thermostat mounted on the remote panel.
 2. Summer Operation: The unit supply fan shall run continuous. The heating water control valve shall be closed. The heating water circulating pump shall be off.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 90A.
- C. Mount units on factory built water tight curb mounted on concrete pad. Install curb level.
- D. Locate remote panels where indicated on drawings.
- E. Install in accordance with manufacturer's instructions.

3.02 SYSTEM STARTUP

- A. Prepare and start equipment. Adjust for proper operation.
- B. Demonstrate operation to Owner's maintenance personnel.

END OF SECTION 23 7433

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**SECTION 25 1300
INSTRUMENTATION AND CONTROL INTEGRATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Integration of instrumentation and controls system, provided by a single systems integrator, furnishing and activating items specified in Sections 25 1300, 25 1316, 25 3100, 25 9100, 25 9110, and 25 9120.
- B. Integration of motor control centers and variable frequency drives, provided by a single systems integrator, furnishing and activating items specified in Sections 26 2419 and 26 2923.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. The Submittals shall consist of legible printed text, high quality drawings, and manufacturer's catalog data bound in an electronic PDF (indexed, book marked, and searchable), that identify major sections of the document. The Submittals shall address all hardware and software to be supplied.
- C. The Submittals shall contain:
 - 1. Identification of the respective responsibilities of each party to the project, including what is provided by the system manufacturer, what is to be subcontracted, etc.
 - 2. Description of the major user related features and operating characteristics of the proposed system.
 - 3. Description of all master site hardware and software, including examples of digital displays, control loops, reports, and how the operator will interface with the system to achieve each specified function.
 - 4. Description and operation of all master configuration features of the I/O and local control loop characteristics.
 - 5. Describe the training program. An outline shall be provided that covers the basic software and hardware training, operator training, system maintenance training, and programming training. Identify the course content and the time spent on each subject area.
 - 6. Describe the startup implementation plan, participants' responsibilities and a schedule of events.
 - 7. All significant equipment to be supplied shall be listed, followed by descriptive data sheets. The equipment list shall include each component name, manufacturer, model number, a description of the operation, quantity supplied, and any special setup and operation and maintenance characteristics.
 - 8. Drawings of equipment to be supplied shall include as a minimum, overall dimensions and details for each unit, including installation arrangements, door mounted operator devices, and instruments. Wiring diagrams of all system components, including field device connections, shall be included and specific installation wiring responsibilities identified.
 - 9. Detailed written sequences of operation describing pre-startup, normal operation, shutdown, and emergency shutdown procedures.
 - 10. Detailed factory and field test procedures at least two weeks before scheduled testing.
 - 11. Color printout of all SCADA screens to be provided. Integrator shall include two (2) trips and two (2) one-day meetings on-site at the Owners location during the development of screens for review of work product to date and direction for further work.
 - 12. Recommended maintenance, special tools, and test equipment.
 - 13. Hardware configuration block diagrams.
 - 14. Network diagrams.
- D. Operation and maintenance manuals.

1.03 MAINTENANCE MANUALS AND RECORD DRAWINGS

- A. O&M Manuals shall be provided as specified in Section 01 7800. In addition to those requirements, specific additional details as indicated below shall be provided.
- B. Provide detailed O&M manuals with complete information concerning the operation of the system and support necessary, with diagnostics down to the module and card replacement level.
- C. Provide a detailed written description of system hardware, software, and system operation. The description of master site hardware and software shall identify pertinent references to sections of standard hardware and software manuals where operational procedures are detailed. Control loops shall be fully described in the O&M manual.
- D. Submit four sets of complete O&M manuals with all project specific information in binders with indexed tab sections. Include manufacturer/supplier, contact and phone number for all equipment listed. Submit a digitized version of complete O&M manuals on disk or CD.
- E. A listing of all recommended spare parts shall be included in the O&M manuals.
- F. Data sheets shall be supplied for all significant equipment used in the system. The data sheet shall include, as a minimum, the component name, manufacturer, model number, quantity, and any special O&M characteristics.
- G. Final record drawings of equipment shall be provided and as a minimum to include:
 - 1. Overall dimensions and details for all equipment and all door mounted operator devices including nameplate designations.
 - 2. Interconnecting wiring diagrams of all master station equipment, including field device connections.
 - 3. PLC and OIT programs including well documented ladder logic program, flow chart, address list, and passwords (electronic).
- H. Detailed written sequences of operation describing pre-startup, startup, normal operation, shutdown, and emergency shutdown procedures.
- I. Alarm list:
 - 1. Provide list of process alarms as configured.
 - 2. Provide list of PLC and SCADA equipment and communications alarms as configured and indicate likely source of problem.
- J. PLC and SCADA programs and graphics documentation: commented, fully documented and cross-indexed ladder diagrams and screen configurations.
- K. Equipment and software manuals:
 - 1. Equipment list identifying components, model numbers, and release levels.
 - 2. Operation and maintenance data for each hardware and software component.
 - 3. Programming/configuration instructions for components.
- L. Guides for locating faults, symptoms, possible causes of trouble, and suggested remedial action.
- M. Detailed instructions on operation of utility programs.
- N. Documentation concerning system software development:
 - 1. Diagrams, code annotation, and other pertinent documents to define system.
 - 2. Listing of screens included in system.
 - 3. Color printout of all screens.
 - 4. Database structures, views, tables, and indexes.
 - 5. List of constants and variables with descriptions.
 - 6. Passwords.
 - 7. Network Addresses.
- O. Documents pertaining to factory and field testing efforts.
- P. Equipment lists including manufacturer's name, part number, serial number, revision number, and recommended spare parts.

- Q. Communication parameters needed to interface with other computers (speed, number of data bits, parity, modem control, etc.).

1.04 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

1.05 MAINTENANCE CONTRACT

- A. The Systems Integrator may offer the Owner a maintenance contract on the system.
- B. The contract shall provide for recommended preventive maintenance, required emergency maintenance and the supply of all consumable items and parts of components which may fail during the life of the contract, and shall be dated to begin when the warranty period expires.
- C. The Owner reserves the right to accept or reject the maintenance contract.
- D. The maintenance contract cost shall not be included as part of this project, but shall be an item negotiated between Owner and systems integrator.

1.06 START-UP BY SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in 01400 and the following.
- B. Provide for equipment installation check, calibrations, control adjustments, startups, and other services in the field by qualified service representative to produce complete working installation in compliance with drawings and specifications, satisfactory to Owner and Engineer.
- C. Provide field startup service at the project site.
- D. This field service is to cover both the separate mounted instrumentation involved in the system and the various control panels and components.
- E. Coordinate with General Contractor, Sub-Contractors and Equipment Suppliers to provide start-up services in concert with other equipment in the project.
- F. In addition to the field services, arrange for Owner training to be performed by the Manufacturer in the use and maintenance of all instrumentation and control system equipment supplied. Refer to scheduled training requirements.
- G. Provide complete start-up services until all systems are fully functional.
- H. Any additional trips and/or days required by the Contractor before or after final startup and training shall not be charged to the Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 INSTALLATION

- A. All units shall be installed in accordance with manufacturer's recommendations and Section 46 0500, and as indicated on drawings.
- B. Units shall be installed and programmed by well qualified and experienced craftsmen and engineers/technicians.
- C. Locations, orientations, and quantities as indicated on drawings.
- D. Units shall be properly interfaced with the input and output devices.
- E. Electrical and control wiring, cabling, conduits, connections, etc. shall be neatly installed.
- F. Include all required and related items for a complete installation.
- G. Manufacturer's shop coating and final finish, as per Section 09 9000, shall be compatible.
- H. Support and anchor all units as per the manufacturer's recommendations and as indicated on drawings.

3.02 RESPONSIBILITY

- A. The instrumentation and control integrator shall be responsible for coordination of the control center components, instrumentation, and supervisory controls with the process equipment installed.
- B. Provide complete shop drawings and wiring diagrams.
- C. To ensure a complete and totally integrated system, a single manufacturer who has had at least five years experience in furnishing similar microprocessor based control and telemetry systems, shall supply all specified equipment and services. This shall include: hardware, software, programming, installation coordination, startup, training, and warranty services as required. The manufacturer shall have successfully completed at least ten similar sized non-proprietary PLC-based telemetry, instrumentation and controls systems.
- D. To ensure an integrated and operational control system it is required that one system integrator shall supply all necessary control equipment and employ the personnel necessary to provide and support the complete system.
- E. Systems Integrator's service organization must stock parts for equipment supplied and be available within 24 hours of verbal notice on all days of the week to provide free service during the guarantee period. System integrator's organization shall include the full complement of engineering, manufacturing, and field services.
- F. Service shall also be available 24 hours per day, 365 days per year.

3.03 SYSTEMS INTEGRATOR

- A. Shall be an Allen-Bradley authorized systems integrator.
- B. Shall have successfully configured and installed at least ten (10) networked systems of similar size, scope, and complexity in water/wastewater plant applications.
- C. Shall provide project engineer for programming the PLCs and SCADA software on this project who is formally trained and experienced with Allen-Bradley and Wonderware or Intellution software.
- D. Experience shall include multiple PLCs, networking on CAT 6 and fiber optic, WAN/LAN networks with multiple SCADA workstations, graphical screens, reporting, operating systems, etc.
- E. Acceptable Systems Integrators:
 - 1. Jetco Inc., Altoona, IA.
 - 2. No Substitutions.

END OF SECTION 25 1300

**SECTION 25 1316
BOXES, PANELS, AND CONTROL CENTERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Control Panels.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit panel layouts: Front and back.
- C. Submit schematic diagrams, fully documented.
- D. Product Data: Provide for all components.

1.03 TESTING, CALLBACK, AND MAINTENANCE SERVICE

- A. Factory test:
 - 1. The master station CPU and peripherals shall be tested at the factory as an integrated system prior to shipment. Factory performance tests shall be performed on all control panels of this contract as indicated in Section 25 9110, Paragraph 2.02 and as indicated on drawings.
 - 2. The Engineer shall be notified at least two weeks in advance of the system test so that a decision may be made as to whether there will be a customer representative present to witness the test.
 - 3. Declining to witness the test shall not be interpreted as negating the requirement to satisfactorily perform the complete factory test as follows:
 - a. Interconnect the CPUs and peripherals to demonstrate actual communication and system operation.
 - b. Each analog and digital signal shall be tested and the desired responses verified (i.e. status inputs shall be verified as to correct display on the LCD display, etc.).
 - c. Analog inputs shall be verified using variable voltage or current input to ensure proper calibration and correct full scale response on the LCD display.
 - d. Analog output levels shall be verified while driving a simulated field load.
 - e. Demonstration of the proper functioning of all controls and control modes.
 - f. Demonstration, while on-line, of the proper operation of all system functions such as automatic restart, failover, etc.
- B. Field inspection and testing:
 - 1. Repeat factory testing after field installation with field and elements.
 - 2. A minimum of five days of field inspection and testing by the manufacturer shall be required, and any additional days necessary to complete field inspection and testing of all control panels under this contract.
 - 3. Field inspection and testing reports shall be provided to the Engineer.
- C. Callback services:
 - 1. Callback services shall be included by the systems integrator to assist in operational adjustments, calibration checks and to provide further operator training.
 - 2. Callback time is based upon the start of the warranty period. Callback work is to be performed as part of the warranty.

1.04 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in 01 4000 and to sign Certificate of Proper Inspection attached at end of Section 01 4000.

PART 2 PRODUCTS

2.01 HARDWARE AND COMPONENTS SPECIFICATIONS

- A. This section shall specify various items of hardware, components, and equipment to be utilized in the controls system.
- B. All panels shall be UL labeled for UL 508A. Panels with Intrinsic safe circuits shall be UL labeled for UL 698A in addition to 508A.
- C. Adequate transient surge voltage protection shall be provided to protect the solid state equipment from voltage surges
- D. All electrical components shall be UL approved and are to be of general purpose, heavy duty grade. Custom designed components not readily available from conventional industry sources shall not be used.

2.02 IDENTIFICATION

- A. All components, door mounted and interior, shall be labeled. Use mnemonic labels (e.g. NTFV1 for north tank flow valve #1) as much as possible. Use each item's official tag name and number.
- B. Nameplates on the exterior of the panel shall be reverse engraved, white letters on black background (or otherwise as indicated), with the exposed face flat and smooth. Standard nameplate size of 0.75" x 2.5".
- C. All components on the interior of the panel shall be labeled with nameplates permanent markings which shall identify the device, cross-referencing it with the schematic drawings.
- D. This shall include every relay, time delay, switch, and all other system components.
- E. All individual wires, both inside control panels/consoles and at each remote instrument or device, shall be wire tagged at each end with a unique number matching the wire number identification on the schematic. Wire tags shall be plastic heat shrunk tags, not paper.
- F. Multiple conductor cable, such as ribbon cable with a permanent plug connector at each end, need not be marked.

2.03 SPARE PARTS

- A. The following spare parts shall be provided:
 - 1. Two units or 10% of the total quantity of each used, whichever is greater, spare indicator lamps, relays and time delays of each type.
 - 2. Ten control fuses of each type and size.

2.04 CONTROL RELAYS

- A. All control relays shall be plug-in style, provided with dust protecting enclosure and identical, 11 blade plug-in bases with screw terminals. All relays in all panels shall be standardized as much as possible to one or minimum number of relay manufacturers and models.
- B. Relays shall have an indication flag to indicate the energized status of the relay.
- C. Any relay whose operating frequency would indicate a life of less than twenty years, shall be solid state, either plug-in as above, or with screw terminals.

2.05 SWITCHES AND PUSHBUTTONS

- A. All panel mounted rotary selector switches and pushbuttons shall be heavy duty, NEMA type 4/13, watertight/oiltight design, 30.5 mm, with screw-type termination.
- B. Two-position, three-position, and four-position rotary selector switches are required as shown on the panel layout drawings and described in the functional description
- C. Include secondary contact block for use in transmitting switch position indication to control system and legend plates.
- D. Approved manufacturers:
 - 1. Allen-Bradley. Model: Bulletin 800T.

2. Square D. Model: Class 9001 Type K.
3. Engineer approved equivalent.

2.06 DOOR SWITCHES

- A. All door switches shall be nose plunger type, housed within a 14 gauge steel mounting plate.
- B. Contact rating: 10 A at 120 VAC.
- C. Approved manufacturers:
 1. Saginaw. Model: SCE-LSA.
 2. Hoffman. Model: ALFSWD.
 3. Engineer approved equivalent.

2.07 ENCLOSURE LIGHTS

- A. All enclosure lights shall meet or exceed IP 20 classification .
- B. LED type light capable of 120 degree angle of illumination.
- C. Input: 120 VAC.
- D. Output: 400 Lm.
- E. Approved manufacturers:
 1. Hoffman. Model: LEDA1S35.
 2. Stego. Model: LED 025.
 3. Engineer approved equivalent.

2.08 OPERATOR INTERFACE PANELVIEW TERMINAL

- A. Existing Allen Bradley Panelview Plus to be relocated from existing control panel SPCP-F.

2.09 INDICATOR LIGHTS

- A. All indicator lights shall be five-element LED type with lamp rated for illumination of 10,000 hour operating life. Dim glow lights are not a suitable alternate.
- B. Power to the lamps shall be limited for extended operational life.
- C. Lamps shall be replaceable from the front of the panel without the use of tools.
- D. Lenses shall be screw-type to allow easy interchange for color coding selection, 30.5 mm.
- E. All lamps shall be the same voltage, low voltage lamps, either 12V or 24V.
- F. Provide integral push-to-test switch design.
- G. Approved manufacturers:
 1. Allen-Bradley: Model: Bulletin 800T.
 2. Square D: Model: Class 9001 type J.
 3. Engineer approved equivalent.

2.10 ETHERNET SWITCHES

- A. Provide industrial hardened Ethernet switches for installation inside control panels (see schedule)
- B. Configuration
 1. Copper: RJ45, 10/100 Base-T.
 2. Full IEEE 802.3 compliant.
- C. Mounting -- DIN rail or direct panel mount. 19" Rackmount where applicable.
- D. Power -- provide power supply adapter (if required) to meet the power specifications of the switch manufacturer.
- E. Configuration- 8 port
 1. Eight copper connections, Ethernet switching function --managed; 708TX.
- F. Acceptable Manufacturers:
 1. N-tron

2. No substitutions
3. Engineer approved equivalent.

2.11 CONTROL PANEL POWER SUPPLIES

- A. Allows up to 50% additional power reserve without reducing output voltage, while minimizing ripple and noise.
- B. UL listed.
- C. Input Voltage: 115/230 Auto select
- D. Output Voltage: 24-28V DC
- E. Output Power: As required for application, minimum 15W
- F. Output Current: As required for application, minimum 0.6A
- G. Temperature range: -40F to 158F
- H. Efficiency: Minimum 80%
- I. Terminals: Screw/ Spring Clamp
- J. Manufacturers:
 1. Allen-Bradley Bulletin 1606-XLP Switch Mode Power Supply.
 2. Engineer approved equivalent.

2.12 CONTROL PANEL SURGE PROTECTION

- A. Phoenix Contact Mains-Plugtrab PT series.
- B. Engineer approved equivalent.

2.13 LOOP ISOLATION

- A. Provide a surge protection device on all input and output circuits (analog, discrete, or digital communication) that enter or leave the building or structure in which the control panel is located.
- B. Manufacturers:
 1. Innovative Technology Type OEM-D22.
 2. EDCO Type PC642.

2.14 CONTROL PANEL ELECTRICAL WORK

- A. Wiring:
 1. Internal panel wiring shall be completed at the factory in a professional manner.
 2. Wiring shall be bundled in wire duct for ease of field modification or tracing, except for the required bundling with wire ties on the run to the door mounted components.
 3. Wire duct shall be provided on field side of terminal blocks to accommodate field wiring.
 4. All field interconnections shall be made to tubular clamp style terminal strips which shall be marked with the wire numbers of the connecting wires.
- B. Materials and protection:
 1. All wire shall be stranded copper, of adequate ampacity in order to provide the rated operating voltage for all components under all extremes of operation.
 2. Wiring which carries low voltage signals subject to transients shall be protected by isolation and shielding.
 3. Insulation - Type MTW cabinet wiring.
 4. Insulation - Type THWN, THHN Field wiring.
- C. Identification:
 1. Each wire shall be identified with an easily readable permanent wire marker, identifying the wire number. Numbering system shall be consistent throughout system, identifying all terminals.
 2. The "record" schematics shall identify that wire number for future maintenance requirements.

3. An exception will be made for ribbon cable connectors which are provided with a permanent connector, providing the cables can be easily unplugged and reinstalled without confusion.
- D. Connections and mounting:
 1. All devices, regardless of location in or on the panel, shall be mechanically mounted and electrically wired in a manner allowing easy removal, replacement, or exchange without requiring a soldering iron or special tools.
 2. All connections shall be of screw-type or plug-type connectors.

2.15 CONTROL PANEL

- A. General
 1. Control panels shall include all items and components as indicated on drawings and specified herein. Provide all necessary internal components and power supplies necessary to perform all functions as previously described.
 2. Provide one duplex convenience outlet and one service light in each panel section.
 3. Electrical service to the control panel as indicated on drawings.
 4. Sufficient expansion space shall be provided in the enclosure to allow a ten percent expansion of the control system requirements. Five percent spare terminals shall be provided with the original installation and space for an additional five percent shall be available for later addition.
 5. Mounting track shall be provided for an expansion of up to ten percent additional relays.
- B. Construction and finish:
 1. Control panels shall be manufactured from a UL listed, NEMA Type enclosure, all welded 14 gage cold rolled steel construction, with stainless steel door hardware, continuous piano hinge, and oil resistant gasket, except as specifically indicated otherwise. This specification for construction and finish is a minimum level. Provide the type of enclosure construction and finish as per the schedule in Section 25 9110, in Paragraph 2.02 "Control Panel Schedule."
 2. The exterior of the enclosure shall be phosphatized, then finished in baked enamel inside and outside. Except stainless steel enclosures, which shall not be coated.
 3. Inner panel shall be finished in white baked enamel.
 4. All cutouts shall be painted so that no raw metal is unprotected.
 5. Color chosen at time of approval of submittal.
 6. After final installation, any damage to the paint finish shall be retouched.
 7. Approved manufacturer:
 - a. Hoffman.
 - b. Engineer approved equivalent.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions and as indicated on Drawings.
- B. Units shall be installed by well qualified and experienced technicians.
- C. Units shall be properly interfaced with the input and output devices.
- D. Include all required-related items for a complete installation.
- E. Contractor shall be responsible for compatibility of manufacturer's shop coating and final finish.
- F. Support and anchor all units as per the manufacturer's recommendations and as indicated on drawings.
- G. Control panels shall be provided with an Underwriters Laboratories (UL) label certifying that the panels meet UL Rule 508A requirements and 698A when applicable. All work shall be in accordance with the National Electric Code and NEMA standards.
- H. Repeat factory testing after field installation with field end elements. A minimum of one day of field inspection and testing by the manufacturer shall be provided. Field inspection and testing reports shall be provided to the Engineer.

END OF SECTION 25 1316

**SECTION 25 3100
REMOTE INSTRUMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Process Instruments (Electrical/Electronic)
 - 1. Flow, Liquid, Magnetic Flow Tube, Large Diameter

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submit legible printed text, high quality drawings, and manufacturer's catalog data bound in notebooks with index tabs that identify major sections of the document.
- C. The submittal shall address all hardware and software to be supplied.
- D. The submittal shall contain:
 - 1. Identification of the respective responsibilities of each party to the project, including what is provided by the system manufacturer, what is to be subcontracted, etc.
 - 2. Description of the major user related features and operating characteristics of the proposed system.
 - 3. Description of all master site hardware and software, including examples of digital displays, control loops, reports, and how the operator will interface with the system to achieve each specified function.
 - 4. Description and operation of all master configuration features of the I/O and local control loop characteristics.
 - 5. Description of the training program. An outline shall be provided that covers the basic software and hardware training, operator training, system maintenance training, and programming training. Identify the course content and the time spent on each subject area.
 - 6. Description of the startup implementation plan, participants' responsibilities and a schedule of events.
 - 7. All significant equipment to be supplied shall be listed, followed by descriptive data sheets. The equipment list shall include each component name, manufacturer, model number, a description of the operation, quantity supplied, and any special setup and operation and maintenance characteristics.
 - 8. Drawings of equipment to be supplied shall include as a minimum, overall dimensions and details for each unit, including installation arrangements, door mounted operator devices, and instruments. Wiring diagrams of all system components, including field device connections, shall be included and specific installation wiring responsibilities identified.
- E. Submit operations and maintenance manuals.

1.03 SERVICE REPRESENTATIVE

- A. Provide qualified Service Representative to perform functions described in Section 01 4000, and to sign the Certification of Proper Inspection attached at the end of Section 01 4000.

1.04 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 PROCESS INSTRUMENTS (ELECTRICAL/ELECTRONIC)

- A. FLOW, LIQUID MAGNETIC FLOW TUBE AND TRANSMITTER (large diameter)
 - 1. General
 - a. Function: Measure, indicate and transmit liquid process flow in a closed full pipe.
 - b. Type: Pulsed DC magnetic field into a conductive process liquid by means of a manufacturer's flow tube.

- c. Parts: Flow element and transmitter with interconnecting cables, mounting hardware, and hand-held field calibrator/configurator.
- 2. Service.
 - a. Type: multiple installations and conditions; see schedule
 - b. Pressure range: multiple installations and conditions; see schedule
 - c. Temperature range: multiple installations and conditions; see installation schedule
 - d. Process pipe size: multiple installations and conditions; see installation schedule
 - e. Process pipe material: metallic lined
 - f. Special conditions: none
- 3. Performance:
 - a. Flow range: see schedule
 - b. Accuracy: +/- 0.5%
 - c. Repeatability: +/- 0.2% of span
 - d. Minimum accurate flow velocity: 1.6 ft/sec.
- 4. Element
 - a. Type: flow tube with liner, electrodes, ground rings, adapter flanges, flange gaskets, seals, and flange bolts as required.
 - 1) Flow tube size: multiple installations, see schedule.
 - 2) Flow tube material: manufacturer's standard
 - 3) Flow tube liner: polyurethane
 - 4) Flow tube electrodes: 316 stainless steel, bullet nose.
 - 5) Flow tube ground rings: 316 stainless steel
 - 6) Flow tube process connection type: flanged, ANSI Class 150.
 - 7) Flow tube flange bolt material: plated steel.
 - 8) Enclosure electrical rating: NEMA 4X/IP67.
 - 9) Enclosure safety rating: FM ordinary location, Class 1, Div. 1, or Class 1. Div. 2 as indicated on plan sheets.
- 5. Transmitter
 - a. Type of physical installation: multiple installations, see schedule.
 - b. Required Features
 - 1) Measurement results: flow rate in programmable engineering units.
 - 2) Local indicator and operator interface.
 - (a) At least a two line LCD display with keypad; field capable of programming, diagnostic evaluation, and flow display (in chosen engineering units) without the requirement of an additional hand held programming device.
 - (b) Alarms: at least two discrete alarms separately programmable for flow high/low and flow direction -- see "Electrical".
 - (c) Transmit a linear signal proportional to the measured signal as scaled by programmable zero and span engineering units -- see "Electrical".
 - (d) Stored operating parameters and calibration data shall not be lost on interruption of power source.
 - 3) Ambient environment:
 - (a) Location: multiple installations and conditions; see schedule
 - (b) Mounting: wall mounted unless otherwise noted.
 - (c) Temperature: within 45 - 110 F.
 - (d) Humidity: up to 90% non-condensing.
 - (e) Controller Enclosure: NEMA 4X/ IP67
 - 4) Electrical
 - (a) Compliance/Certification/Listing: manufacturer's standard.
 - (b) Power Source: 120 VAC 60 Hz, 25 VA max.
 - (c) Discrete outputs: at least one output capable of sinking up to 150 mA @ 30 Vdc max.

- (d) Analog output(s): minimum of one isolated 4-20 mA output capable of driving at least a 500 ohm external load.
- 6. Acceptable Manufacturers
 - a. Rosemount: Series 8750W flow tube with Series 8712 transmitter.
 - b. Endress + Hauser Promag 400W Series.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install units in accordance with manufacturer's recommendations and as indicated on drawings.
- B. Units shall be installed and programmed by well qualified and experienced craftsmen and engineers/technicians.
- C. Locations, orientations, and quantities as indicated on drawings.
- D. Units shall be properly interfaced with the input and output devices.
- E. Electrical and control wiring, cabling, conduits, connections shall be according to Division 26 and this Section.
- F. Include all required-related items for a complete installation.
- G. Contractor shall be responsible for compatibility of manufacturer's shop coating and final finish.
- H. Support and anchor all units as per the manufacturer's recommendations and as indicated on drawings.

END OF SECTION 25 3100

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**SECTION 25 9100
CENTRAL CONTROL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Central control equipment and programming including PLCs and UPSs.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. The submittal shall consist of legible printed text, high-quality drawings, and manufacturer's catalog data bound in notebooks with index tabs that identify major sections of the document.
- C. The submittal shall address all hardware and software to be supplied.
- D. In addition to the above requirements, the submittal shall also contain:
 - 1. Identification of the respective responsibilities of each party to the project, including what is provided by the system manufacturer, what is to be subcontracted, etc.
 - 2. Description of the major user-related features and operating characteristics of the proposed system.
 - 3. Description of all master site hardware and software, including examples of digital displays, control loops, reports, and how the operator will interface with the system to achieve each specified function.
 - 4. Description and operation of all master configuration features of the I/O and local control loop characteristics.
 - 5. Describe the training program. An outline shall be provided that covers the basic software and hardware training, operator training, system maintenance training, and programming training. Identify the course content and the time spent on each subject area.
 - 6. Describe the startup implementation plan, participants' responsibilities and a schedule of events.
 - 7. All significant equipment to be supplied shall be listed, followed by descriptive data sheets. The equipment list shall include each component name, manufacturer, model number, quantity supplied, any special setup, and operation and maintenance characteristics.
 - 8. Drawings of equipment to be supplied shall include as a minimum, overall dimensions and details for each unit, including installation arrangements, door mounted operator devices, and instruments. Wiring diagrams of all system components, including field device connections, shall be included and specific installation wiring responsibilities identified.
 - 9. Detailed written sequences of operation describing pre-startup, normal operation, shutdown, and emergency shutdown procedures.
 - 10. Detailed factory and field test procedures at least two weeks before scheduled testing.
 - 11. Color printout of all MMI screens to be provided. Integrator shall include two (2) trips and two (2) meetings on-site at the Owner's location during the development of screens for review of work product to date and direction for further work.
 - 12. Recommended maintenance, special tools, and test equipment.
 - 13. Hardware configuration block diagrams.
 - 14. Network diagrams.
- E. Submit operations and maintenance manuals.

1.03 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and the following.
- B. Provide for equipment installation check, calibrations, control adjustments, startups, and other services in the field by qualified service representative to produce complete working installation in compliance with drawings and specifications, satisfactory to Owner and Engineer.

- C. This field service is to cover both the separate mounted instrumentation involved in the system and the various control panels and components.
- D. Provide full field startup service for complete system at project site. Coordinate with other trades and suppliers to ensure proper start-up of all equipment.
- E. In addition to the field services, arrange for Owner training to be performed by the Manufacturer in the use and maintenance of all instrumentation and control system equipment supplied.
- F. Address coordination - coordinate with Owner's IT staff for IP address structure. Coordinate and supply IP address to equipment manufacturers as required by project. Document and record addresses used for project.
- G. Additional trips and/or days required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.04 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Alarm/Event Logging Colors. The following is the color scheme for alarms and events that are displayed on the MMI:
 - 1. Owner's existing color scheme shall be followed.
- B. Equipment Status and Data Information for MMI Displays. The following is the color scheme for dynamic changing status:
 - 1. Owner's existing color scheme shall be followed.
 - 2. Double Border Box: Indication of an analog process operator entered setpoint.
- C. Alarm/Event Logging. All alarms and events shall be logged to a tabular display on the computer software MMI's display screen with date, time, tagname, description, status, value, and priority of alarms/events. The tabular display screen shall allow the Operator to acknowledge all alarms. Events shall include start/stop of equipment, open/close or position change of valves, operator initiated changes, setpoint changes, etc. The MMI will also log this data to a historical data file. Up to an Operator adjustable setpoint, a number of current events and alarms shall be displayed on the tabular screen, with the older events and alarms beyond that setpoint number being stored in the historical database log.
- D. Change-of-State Alarms. All PLC discrete output commands shall be compared to their respective process feedback status signal to verify proper execution. If the feedback status does not match the most recent output command (after an Operator adjustable time delay), the PLC will initiate an alarm condition. The alarm condition requires an Operator acknowledgement only after the Operator is logged onto the system.
- E. General Monitoring, Displaying, and Logging of Discrete Input Signals. Discrete input signals which represent equipment status will be displayed on the computer software MMI display screens.
- F. General Monitoring, Displaying, and Recording of Analog Input Signals. Process variable signals shall be displayed on the computer software MMI's display screens. They shall be scaled in engineering units. All alarm limits are assigned to the associated process variable. Values shall be historically logged and trended as required.
- G. Process Status. All process alarms, equipment status, and process variable values shall be available at any of the computer software MMI's display screens. Failures of any PLC on the network shall also be alarmed.
- H. Equipment Run Times. The running time for all motorized equipment located in the plant and at all remote sites shall be totalized and displayed.

- I. Flow Totalizations. All flow rate values shall be integrated and totaled for display on the computer software MMI's display screens.
- J. Automatic Rollover. Provide automatic rollover back to zero for all run times, meter totalizations, etc. Provide reports with automatic calculation to account for the automatic rollover to zero.
- K. Trends. All process variable signals can be selected to be displayed on the computer software MMI's display screens. Provide a historical trend embedded window for each process element that is designated to be trended on a given screen. Provide a trend button to bring up the embedded trend window over a portion of the given screen, with the option to expand the trend window to the full screen view.
- L. All computer MMI display screens that allow an Operator to enter setpoints and to change software switches shall be password protected. An Operator must successfully log in with his password before any changeable setpoints are allowed.
- M. For all PID control loops, provide pop-up window with PID control station graphic. This pop-up window shall display auto/manual status, process variable, set point and control output scaled in engineering units. Operator shall be allowed to change auto/manual toggle, set point manual adjust, and control output manual adjust.
- N. Provide an Operator adjustable time delay setpoint with all setpoints throughout the control system.
- O. Provide de-bounce timers or other programming logic throughout the system to prevent all alarms, setpoints, or controls repeat; and nuisance or otherwise unneeded alarms, starts, stops, etc.
- P. Provide scan rate time delays or other programming logic throughout the system to prevent all alarms, setpoints, or controls repeat; and nuisance or otherwise unneeded alarms, starts, stops, etc.
- Q. Provide testing and logic to positively ensure that no lockout conditions can develop in any way or in any form of operation, be it standard, non-standard, or emergency.
- R. Monitor communications status of all remote facilities and plant panels.
- S. Monitor each PLC's status at all remote facilities and plant panels.
- T. Where alarms are called for provide High and High-High, Low and Low-Low, and others if specifically required.
- U. All VFD-driven pumps when operated in Hand shall be controlled by % Speed directly.
- V. Provide software Hand/Off/Auto switches, Duty/Standby switches, Local/Off/Remote switches, On-line/Off-line switches, Open/Close switches, Open/Stop/Close switches, Open/Stop/Close/Auto switches, Manual/Auto switches, On/Off pushbuttons, etc. for each equipment item.
 - 1. Provide software Hand/Off/Auto switches for all motorized equipment, except for motorized valves. For motorized modulating valves provide open/stop/close/auto switches; for open/close motorized valves provide open/close/auto switches. In many cases, hand switch "Hand/Off/Auto" has also been provided. These situations are considered to be "cascade" control. The hand switch is considered to be the "master". Control from the soft switch can only be accomplished if the hand switch is in the auto position. Do not allow operation of the soft switch if the hand switch is not in the auto position.
 - 2. Provide software open/close/auto switches for all open/close controlled valves, both solenoid and motor operated. Where a valve has a hand open/close/auto selector switch, the hand switch is the "master". Control from the soft switch can only be accomplished if the hand switch is in the auto position. Do not allow operation of the soft switch if the hand switch is not in the auto position.
 - 3. For all motorized modulating valves, the PID control station shall be considered manual control. Control from the soft station can only be accomplished if the hand switch is in the auto position. Do not allow operation of the soft station if the hand switch is not in the auto position.

4. In the software On-line/Off-line selector, provide a software pop-up "tag-out" box with descriptor lines for Operator entry of wording describing the reason for the device being out of service, for each item of equipment, instrumentation, etc. Change the equipment device color to yellow on the applicable screens to visually indicate that it is off-line and tagged out, and cannot be operated through the control system as long as tagged out. The On-line/Off-Line switch and Tag-Out shall be used to isolate control and/or defeat erroneous status indication through the PLC and MMI system for the particular device, but shall not affect the operation of the particular treatment process or plant as a whole.
- W. Change piping/valves/equipment/building color to indicate flowing or not, working or not, operational or not, running or not, opened or closed, etc.
- X. Screens shall be fully dynamic.
- Y. In the list of MMI Screens are described as either "Pictorial" or "Tabular".
 1. "Pictorial" shall balance clarity of process functionality with 3D spatial appearance. For pictorial screens representing large numbers of equipment and multiple processes (overviews) schematic process functionality shall take precedence. Where pictorials represent a single equipment or process area, 3D representation of actual spatial arrangement shall prevail. All pictorial screens will also include data values, process variables, etc. displayed alongside the graphical objects, and various buttons, lines of text, etc. The level of graphics shall be of the highest level of capability of the software.
 2. "Tabular" shall be defined as a screen showing tables or boxes of data values, process variables, data entry boxes, etc. with verbal descriptors and lines of text. Some pictorial representations of objects (eg. an HOA switch) shall be included, and some hybrid schematic/tabular screens will be required. The level of graphics shall be of the highest level of capability of the software.
- Z. The intent of MMI screens development is to provide a complete "Pictorial" screen for each process system or element as defined, with the subsequent "Tabular" screens being "pop-up" screens accessed by a button or double-clicking on a particular equipment item or component of the pictorial screen. Each pop-up tabular screen shall appear as an embedded window over a portion of the given pictorial screen, with the option to expand the window to the full screen view. These tabular screens shall display the particular object's data values of status, alarms, setpoints, etc. and provide for Operator entry of values.

2.02 FUNCTIONAL DESCRIPTION

- A. General Function Descriptions for Commonly Applied Routines
 1. Open/Close Valve Control
 - a. Control Elements
 - 1) HOR (Hand-Off-Remote) hand switch
 - 2) OCA (Open-Close-Auto) soft switch
 - b. Feedback Elements
 - 1) HOR hand switch in the Remote position
 - 2) Opened limit switch
 - 3) Closed limit switch
 - c. Alarms
 - 1) Valve failed to open
 - 2) Valve failed to close
 - d. Process Set Points
 - 1) Valve failed to open/close time delay
 - e. Process Control/Monitor Routines
 - 1) When valve is required open or close (in automatic mode, only) start the time delay to check that valve reaches its required position as verified by its limit switch; annunciate an alarm if the valve does not reach its required position and the time delay has expired.

- 2) See individual process descriptions for appropriate process failure recovery routines when an associated valve fails.
2. Equipment Start/Stop and Elapsed Time Monitoring
 - a. Control Elements
 - 1) Lifetime hours reset soft switch (supervisor security).
 - 2) Lifetime starts reset soft switch (supervisor security).
 - 3) Maintenance hours enable/disable soft switch (maint. supervisor security)
 - 4) Maintenance hours Task 1 reset soft switch (maint. supervisor security)
 - 5) Maintenance hours Task 2 reset soft switch (maint. supervisor security)
 - 6) Maintenance hours Task 3 reset soft switch (maint. supervisor security)
 - 7) Weekly Elapsed Time and Start/Stop enable/disable (operations supervisor security)
 - 8) Daily Elapsed Time and Start/Stop enable/disable (operations supervisor security)
 - 9) Run lifetime hours and start/stop report soft switch.
 - 10) Run maintenance hours report soft switch.
 - b. Feedback Elements
 - 1) Equipment "running" inputs.
 - c. Alarms
 - 1) Maintenance hours Task 1 required (maintenance alarm group)
 - 2) Maintenance hours Task 2 required (maintenance alarm group)
 - 3) Maintenance hours Task 3 required (maintenance alarm group)
 - 4) Daily operating hours high/low
 - 5) Daily start/stops high/low
 - d. Process Set Points
 - 1) Maintenance hours Task 1 target value
 - 2) Maintenance hours Task 2 target value
 - 3) Maintenance hours Task 3 target value
 - 4) Daily operating hours high
 - 5) Daily operating hours low
 - 6) Daily start/stops high
 - 7) Daily start/stops low
 - 8) Weekly Master Reset (Day and time of day)
 - 9) Daily Master Reset (time of day)
 - 10) Auto Alternation ratio
 - 11) Auto Alternation mode standard/reserve (each piece of duplicate equipment) soft switch.
 - e. Process Control/Monitor Routines
 - 1) Equipment Lifetime Operating Hours register -- Provide one register in whole hours. Provide automatic rollover when the maximum number is reached.
 - 2) Equipment Lifetime Starts register -- Provide one register for number of starts. Provide automatic rollover when maximum number is reached.
 - 3) Maintenance Hours Tasks registers -- Provide registers in whole hours. Maintenance personnel may enter a desired time where "maintenance alarms" may be generated for scheduled maintenance tasks dependent on the number of equipment operating hours. Provide a "text box" (for each task) so that each task can be readily identified.
 - 4) Weekly Operating Hours Registers -- Provide two registers each for weekly operating hours. One register shall be reserved for "last week"; the other for "current week" operating hours. According to a "Weekly Master Reset" set point (day and time), all equipment "current" registers data shall be stored in the "last week" register and the current register shall be reset to zero.

- 5) Weekly Start Registers -- Provide two registers each for weekly starts. One register shall be reserved for "last week"; the other for "current week" operating hours. According to the "Weekly Master Reset" set point (day and time), all equipment "current" registers data shall be stored in the "last week" register and the current register shall be reset to zero.
 - 6) Daily Operating Hours Registers -- Provide two registers each for daily operating hours. One register shall be reserved for "yesterday"; the other for "today" operating hours. According to a "Daily Master Reset" set point (time of day), all equipment "today" registers data shall be stored in the "yesterday" register and the today register shall be reset to zero.
 - 7) Provide a reporting routine for print out of: lifetime hours and starts (operator initiated), maintenance hours (operator initiated), weekly hours and starts (auto generated), and daily hours and starts (auto generated). For each equipment item, operators/maintenance personnel shall have the option of enabling/disabling the maintenance, weekly, and daily routines; the lifetime hours are mandatory and cannot be disabled.
 - 8) Automatic Alternation (where duplicate process equipment exists) shall be based on the "current weekly" operating hours registers and their respective HOA hand switches (or soft switches if no hand switch exists). An additional status soft switch (for each duplicate piece of equipment) may be toggled from "standard" to "reserve" status (for only one). This "reserve" equipment is only automatically started according to a ratio of all other duplicate equipment in "standard" mode. Example: Assume the ratio is two (2) and one piece of duplicate equipment is selected as "reserve; the reserve equipment is only operated at one-half the hours of the duplicate equipment in "standard" mode.
3. Process Flow Monitoring
- a. Control Elements
 - 1) Associated equipment on/off status flow totalization interlock on/off soft switch
 - 2) Totalize monthly enable/disable soft switch
 - 3) Totalize weekly enable/disable soft switch
 - 4) Totalize daily enable/disable soft switch
 - 5) Cyclic totalization enable/disable soft switch
 - 6) Scheduled Maintenance Totalization enable/disable soft switch
 - 7) Scheduled Maintenance Flow Total Reset soft switch (maintenance supervisor security)
 - b. Feedback Elements
 - 1) Associated flow transmitter
 - 2) Associated equipment on/off indication (providing the flow)
 - c. Alarms
 - 1) Flow (HH, H, L, LL)
 - 2) Maintenance flow total exceeded (alarm group)
 - d. Process Set Points
 - 1) Minimum flow to enable totalization (in percent of span)
 - 2) Maintenance flow totalization target value
 - e. Monitor/Control Routines
 - 1) Basic flow monitoring
 - (a) Do not totalize flows unless the associated equipment "running" status is indicated. Where multiple pumps/blowers, etc. provide flow to a single flow meter, at least one pump should indicate a "running" status. Also, do not totalize flow unless the minimum flow level has been reached. Disable all flow alarms if no equipment is "required" to run.
 - 2) Flow Totalization

- (a) Provide a minimum of three totalization periods: monthly, weekly, and daily. For each time period, provide two storage registers: one for "last" period, one for "current" period. For all three time periods, provide separate resets based on day-of-month, day-of-week, and time-of-day. Base Engineering Units (of totalization) shall be as required to produce three (3) significant figures.
 - (b) Provide one additional set of registers for "last" and "current" cycle for cyclic based operations such as pump-down of a wet well by float switches. Include time and date stamp for last cycle plus duration. At the time of another equipment start, transfer (from current to last), generate an event log item for the previous "last" record.
 - (c) Provide registers for scheduled maintenance totalization. Once the total has been reached, activate a special maintenance alarm (no audible, just display). This total must be manually reset by an approved maintenance person.
- 4. Remote Alarm Notification
 - a. MMI SCADA Based Remote Alarms
 - 1) Provide an alarm "word" (such as an integer address) for each major piece of equipment and/or process area described in the above sections. For each alarm "word" provide a "mask word" and a resultant "masked" alarm word. A mask word containing all "1's" allows all alarms to generate a remote alarm. Where the mask word contains "zeros" those particular alarms would be prevented from generating a remote alarm. In addition, provide a series of "combination words". These combination words are assigned a value. Whenever, the alarm word value equals the combination word value, a remote alarm is generated i.e. alarm1 "and" alarm2 "and" alarm3 = remote alarm "x".
 - 2) Provide a graphical "matrix" table for each remote alarm word. The horizontal rows are the individual alarms, the columns shall represent the individual bits of the alarm word, the alarm mask, and then a series of combination alarm words. Default values for all alarm mask words and combination words shall be zero.
 - 3) Software program shall be WIN911 and shall be used to generate alarms to the proper people according shifts and weekends. Modem as indicated on drawings.

2.03 FUNCTIONAL DESCRIPTION AND IMPLEMENTATION GUIDELINES

- A. For equipment and PLC I/O points indicated as being removed in P&IDs - remove associated programming from respective PLC and SCADA
- B. Motor Control Centers (MCCs)
 - 1. Associated Equipment
 - a. (1) MCC
 - 2. Control Elements
 - a. None
 - 3. Feedback Elements -- as listed on IC sheets.
 - 4. Alarms
 - a. Individual MCC Power Fail
 - b. Individual MCC SPD Fail
- C. RDT Polymer System
 - 1. Associated Equipment
 - a. Two (2) polymer feeder/blender units
 - 2. Control Elements
 - a. Two (2) polymer feeder/blender hand/off/auto hand switch
 - b. Two (2) polymer feeder/blender hand/off/auto soft switch
 - c. Polymer feeder/blender 1 RDT service 1/2 soft switch
 - d. Polymer feeder/blender 2 RDT service 1/2 soft switch
 - 3. Feedback elements
 - a. See P&IDs and schematic details located on IC sheets.

4. Process Set Points
 - a. Individual polymer feeder/blender sludge concentration (mg/L - password protected set point)
 - b. Individual polymer feeder/blender polymer dose (#/dry ton - password protected set point)
 - c. Individual polymer feeder/blender high flow
 - d. Individual polymer feeder/blender low flow
 5. Interlocks and Safeties
 - a. Flow alarms shall be interlocked with equipment operation.
 - b. Auto operation is not allowed unless all associated equipment is selected to the auto mode and no E-stops are pressed.
 6. Alarms
 - a. Individual polymer feeder/blender required not running failure
 - b. Individual polymer feeder/blender low water pressure
 - c. Individual polymer feeder/blender low flow
 - d. Individual polymer feeder/blender high flow
 - e. Analog values out of range
 - f. Power failure
 7. Control Routines
 - a. Polymer Feeder/Blenders
 - 1) Feeder/Blender shall be paired with RDT based on soft selector switches.
 - 2) Feeder/Blender shall operate when associated RDT is operating and sludge is flowing.
 - 3) Feeder/Blender shall be paced based on RDT sludge flow using concentration and dose set points (Equation: $\text{Polymer Flow Rate (gpm)} = [\text{Active Polymer (lb/ton)} * \text{Sludge Flow Rate (gpm)} * \text{Sludge Concentration (\%/100)}] / [2000 \text{ (lb/ton)} * \text{Polymer Concentration (\%/100)}]$)
 - 4) Feeder/Blender shall be failed and taken out of service for required not running and low water pressure with manual reset required.
 - 5) Manual Control - feeder/blender shall be capable of local operation at the local control panel in the event automatic operation fails via the HOA switches and speed Pots.
- D. RDT (Rotary Drum Thickener) System
1. Associated Equipment
 - a. Two (2) RDT units - each with dual drums
 - b. Two (2) spray water booster pumps - each dedicated to a RDT
 - c. Two (2) exhaust fans - each dedicated to a drum pair
 - d. Two (2) sludge flow meters - WAS and Digested Sludge
 - e. One (1) thickened sludge flow meter - Thickened Digested Sludge
 - f. Two (2) WAS storage tank pumps
 - g. One (1) digester transfer pump and associated discharge valve.
 - h. One (1) TWAS transfer pump.
 - i. One (1) thickened digested sludge transfer pump.
 2. Control Elements
 - a. Two (2) RDT (drum) hand/off/auto hand switch - one located on each manufacturer's control panel
 - b. Two (2) RDT (drum) hand/off/auto soft switch
 - c. Two (2) Floc Tank (mixer) hand/off/auto hand switch - one located on each manufacturer's control panel
 - d. Two (2) Floc Tank (mixer) hand/off/auto soft switch
 - e. Two (2) spray water booster pump hand/off/auto hand switch - one located on each manufacturer's control panel

- f. Two (2) spray water booster pump hand/off/auto soft switch
- g. Two (2) exhaust fan hand/off/auto hand switch - one located on each manufacturer's control panel
- h. Two (2) exhaust fan hand/off/auto soft switch
- i. Two (2) WAS pump hand/off/auto hand switch
- j. Two (2) WAS pump hand/off/auto soft switch
- k. One (1) Digester transfer pump hand/off/auto hand switch
- l. One (1) Digester transfer pump hand/off/auto soft switch
- m. One (1) TWAS transfer pump hand/off/auto hand switch
- n. One (1) TWAS transfer pump hand/off/auto soft switch
- o. One (1) thickened digested sludge transfer pump hand/off/auto hand switch
- p. One (1) thickened digested sludge transfer pump hand/off/auto soft switch
- q. One (1) 1/2-2/1-Auto alternation WAS Pump soft switch
- r. One (1) RDT NO. 1 WAS/Sludge mode soft switch
- s. One (1) RDT NO. 2 WAS/Sludge mode soft switch
- t. One (1) digester transfer pump thickening/storage mode soft switch
- u. Two (2) RDT start soft switch
- v. Two (2) RDT stop soft switch
- 3. Feedback elements
 - a. See P&IDs and schematic details located on IC sheets.
- 4. Process Set Points
 - a. Fail to operate delay RDT (drum) (Initial set point at 30.0 sec)
 - b. Fail to operate delay spray water booster pump (Initial set point at 30.0 sec)
 - c. Fail to operate delay floc tank mixer (Initial set point at 30.0 sec)
 - d. Fail to operate delay exhaust fan (Initial set point at 30.0 sec)
 - e. Fail to operate delay WAS pump (Initial set point at 30.0 sec)
 - f. Fail to operate sludge transfer pump (Initial set point at 30.0 sec)
 - g. Individual exhaust fan stop delay (Initial set point at 5.0 min)
 - h. WAS Pump WAS Tank level cutout
 - i. Individual RDT feed rate
 - j. Individual RDT drum speed
 - k. Individual RDT floc drive speed
 - l. Individual RDT stop delay (Initial set point at 20.0 min)
 - m. Individual sludge high flow
 - n. Individual sludge low flow
 - o. Individual thickened sludge level high-high
 - p. Individual thickened sludge level high
 - q. Individual thickened sludge level low
 - r. Individual thickened sludge level low-low
 - s. Individual thickened sludge pump start elevation (shall set max speed elevation with max speed equal to 100%)
 - t. Individual thickened sludge pump stop elevation
 - u. Individual thickened sludge pump minimum speed Elevation
 - v. Individual thickened sludge pump minimum speed percentage
 - w. Thickened Sludge Pump suction pressure delay
 - x. Thickened Sludge Pump discharge pressure delay
- 5. Interlocks and Safeties
 - a. Hopper high level alarm shall be interlocked with equipment operation.
 - b. Polymer feeder/blender operation and WAS pump/transfer pump shall be interlocked with RDT operation.
 - c. Auto operation is not allowed unless all associated equipment is selected to the auto mode and no E-stops are pressed.

- d. Flow alarms shall be interlocked with equipment operation.
- e. Pressure alarms shall be interlocked with equipment operation.
- 6. Alarms
 - a. Individual pump and any RDT associated equipment required not running failure and fault(VFD)
 - b. Individual pump and RDT overtemp
 - c. individual pump low suction pressure
 - d. individual pump high discharge pressure
 - e. Individual polymer feed pump alarm
 - f. Individual RDT flow high-high
 - g. Individual RDT flow high
 - h. Individual RDT flow low
 - i. Individual RDT flow low-low
 - j. Individual thickened sludge level high-high
 - k. Individual thickened sludge level high
 - l. Individual thickened sludge level low
 - m. Individual thickened sludge level low-low
 - n. Analog values out of range
 - o. Communication failure
 - p. Power failure(s)
- 7. Control Routines
 - a. Digester Transfer Pump
 - 1) Existing Digester transfer pump motor control and discharge valve are control out of SPCP-C. Motor control will change from on/off control to VFD control. New VFD will be connected to SPCP-L.
 - 2) In storage mode, pump shall operate as it currently does with a new manually set speed.
 - 3) In thickening mode, pump shall operate with the associated RDT and speed modulated to maintain flow set point.
 - b. WAS Tank Pumps
 - 1) WAS Tank Pumps shall operate in a lead/standby configuration.
 - 2) Provided interlock conditions are met, in automatic, the WAS tank pump shall operate in conjunction with the selected down stream RDT equipment. When RDT running is active, the WAS tank pump shall run and modulate to meet the RDT feed rate set point.
 - 3) If the WAS tank level cut out is enable, the RDT pump shall be inhibited when secondary digester level drops below the cutout level.
 - c. Polymer Feed Pumps
 - 1) Provided interlock conditions are met, in automatic, the polymer feed pump shall operate in conjunction with the selected down stream RDT equipment. When RDT running is active and flow is seen through RDT influent flow meter, the polymer feed pump shall operate.
 - 2) See general descriptions above for polymer feed pumps for additional requirements.
 - d. RDT's
 - 1) Provided interlock conditions are met, in automatic, the RDT shall operate in conjunction with the selected down stream thickened sludge pump. The RDT drum shall start/stop with soft selector switch. Drum will operate at the drum speed set point.
 - 2) Operation of the drum shall start the wash system and floc drive. Floc drive will operate at the floc drive speed set point.

- 3) When the RDT drum is running as verified by drive status and "at speed" verification, and the wash water system is running, as verified by the pump running aux. contact/pressure switch and the floc drive as verified by the floc drive running aux. contact, the associated RDT feed pump started.
- 4) When the RDT stop soft selector switch is selected, the auto stop sequence shall begin.
- 5) The polymer pump shall be stopped. When the polymer pump has stopped and its off-delay time has expired, the RDT feed pump shall stop. Note this off delay time is important and is used to purge the sludge line (from polymer injection point to the RDT) before the RDT feed pump is stopped.
- 6) After the RDT feed pump has stopped, the RDT drum drive off-delay shall be started.
- 7) When RDT drum drive has shutdown, the wash water booster pump shall be stopped. The RDT process is now completely shutdown.
- e. Thickened Sludge Pumps
 - 1) Provided interlock conditions are met, in automatic, the thickened sludge pump shall operate in conjunction with the selected up stream RDT equipment.
 - 2) Thickened sludge pumps shall operate based on the associated start and stop thickened sludge level set points.
 - 3) Speed of the thickened sludge pump shall be modulated proportionally based on the thickened sludge speed control set points and the measured thickened sludge level.
- f. Manual Control
 - 1) Each pump shall be capable of local operation at the MCC in the event automatic operation fails via the HOA switch and speed set using the VFD HIM.
 - 2) Each RDT shall be capable of local operation at the manufacturer's local control panel in the event automatic operation fails via the HOA switch and speed set using the VFD HIM.
 - 3) Each valve shall be capable of local operation at the valve actuator in the event automatic operation fails via local controls on valve actuator.

E. SCADA

1. General
 - a. This system shall be classified in two sections: One is referred to (in the preceding functional descriptions) as the "MMI"; the other is the PC based SCADA system, which in this project, is used for basic data monitoring, archiving, remote alarm dialing and report generation.
 - b. All SCADA programming is provided by Systems Integrator.
 - c. All PLC and MMI (PanelView) programming is provided by Systems Integrator.
 - d. System Integrator shall coordinate with Owner for equipment removals for data exchange.
2. Proposed MMI Screens
 - a. Remove all screens and programming associate with equipment that is being removed.
 - b. Create pictorial screens (at minimum) including:
 - 1) Update Overview of treatment plant site to revised sludge thickening.
 - 2) Overview of electrical detail area with common values and status.
 - (a) MCC operation detail
 - 3) Overview of sludge thickening and polymer area with common values and status.
 - (a) (2) Polymer Feeder/Blender operation detail
 - (b) (2) RDTs, sludge feed valves, flow meters, associated booster pumps, and exhaust fan operation detail
 - (c) (2) WAS pump operation detail
 - (d) (1) digester transfer pump operation detail
 - (e) (2) thickened sludge pump operation detail

- 4) Detail view with status of Ethernet network
- 5) Detail view of alarm management enable/disable
- 6) Provide Two (2) additional screens of a complexity equal to the average of the above. The Systems Integrator shall budget adequate time and expenses to develop these three additional screens as defined by the Owner.
- c. Trend Screens
 - 1) Create associated trend screens for all pictorial screens described above.
 - 2) Provide One (1) additional screen of a complexity equal to the average of the above. The Systems Integrator shall budget adequate time and expenses to develop these three additional screens as defined by the Owner.
- d. Tabular Screens
 - 1) Create tabular screens for data entry, live data monitoring, and related soft switch control as related to all major equipment items. Tabular screens may be normally be of "pop-up" type by clicking on an associated piece of equipment.
- e. Reports
 - 1) All reports shall be provided with automatically derived data calculations.
 - 2) Alarm Summary Report
 - 3) Equipment Elapsed Time and Starts Report
 - 4) Process Flows Report
 - 5) Polymer Usage Report
 - 6) Provide One (1) additional reports of a complexity equal to the average of the above reports. The Systems Integrator shall budget adequate time and expenses to develop these three additional reports as defined by the Owner.

2.04 UNINTERRUPTIBLE POWER SYSTEMS (UPS) FOR PLCS, PCS, AND WORK STATIONS

- A. Approved Manufacturers:
 1. Cutler-Hammer 9SX Series.
 2. Liebert GTX4 Series.
 3. Engineer approved equivalent.
- B. General:
 1. True double conversion on-line configuration.
 2. Lightning and Surge Protection: Passes ANSI/IEEE C62.41 Categories A and B.
 3. Energy Dissipation: 300 Joule.
 4. Noise (RF) Isolation: Low-voltage: 5 - 45 dB common mode, 28 - 90 dB normal mode. High-voltage: 5 - 60 dB common mode, 28 - 80 dB normal mode. Full time, advanced, multi-stage filter.
 5. Nominal Voltage: 120 VAC.
 6. Input: Default 92-136 VAC. User adjustable 88-137 VAC; 45-65 Hz.
 7. Input Protection: Fuse.
 8. Output Voltage: 105 VAC - 136 VAC (user adjustable).
 9. Brownout Protection: Brownout Boost output 14 - 17% above the input voltage. Transfer point user adjustable
 10. Output Waveform: Pure sine-wave, less than 5% THD on inverter; same as line on AC line.
 11. Output Protection: Automatic (current and overvoltage).
 12. Output Frequency: On line, tracks line frequency; On battery, microprocessor controlled. 50 or 60 Hz +/- 0.5 H.
 13. Safety: UL listed, CSA certified or cUL listed. FCC class B for 360 VA.
 14. Efficiency: 95% (on-line).
 15. Operating Environments: 0° to 45°C (32 to 113°F); 40°C or 104°F for the 1.7K ERT.
 16. Altitude: 10,000 ft (3,000 m) maximum, operating; 40,000 ft (12,000 m) maximum, storage.
 17. Audible noise at One Meter: 38 - 44 dB.
 18. Communications Port: Contact closures (inverter and alarm) or RS 232 bidirectional communication (user selectable).

19. Battery: Sealed, maintenance-free UL 924 recognized.
20. Battery Charger: Recharge rate shall be maximum ten times the full-load discharge time.
21. Size UPS based on power requirements of connected equipment. As a minimum, the UPS shall provide backup power to the PLC and related equipment to support communications functions and operator interface screens.
22. Digital Displays showing:
 - a. True, Load-dependent Run-time.
 - b. Percent Loading.
 - c. Volts In/Volts Out.
 - d. Battery Voltage.
 - e. Alarm Messages.
23. Run-Time of 30 minutes at UPS full load.
24. LED Indicators: Line, battery and alarm status.
25. Check UPS automatic shutdown software.

2.05 PROGRAMMABLE LOGIC CONTROLLER

A. Medium PLC.

1. Programmable logic controller:
 - a. The PLC shall be capable of performing relay logic, timing, counting, sequencing, proportional-integral-derivative (PID) control and other functions as required by the drawings and specifications. Quantity and location as shown in the instrumentation and controls schedule.
 - b. The unit shall be complete with rack, power supply, modules, cables and connectors.
 - c. The PLC shall be equipped with a 2M word minimum memory for user programming and data storage.
 - d. The PLC shall automatically start-up after a power failure, and retain the program and setpoints so that the system starts automatically when power is restored.
 - e. The PLC rack shall have sufficient empty slots to accommodate additional modules for 30% future expansion.
2. Input/output requirements:
 - a. Digital inputs (120 Vac nominal)
 - 1) On State: 79 - 132 Vac; Off State: 0 - 20 Vac
 - 2) LED indicator.
 - b. Digital outputs (120 Vac nominal):
 - 1) Max. Voltage = 240 Vac; @ 120 Vac, 2.5A continuous.
 - c. Analog inputs:
 - 1) Field selectable 4-20 mADC or 1-5 VDC input on each channel, 8 channel.
 - 2) Input isolation rated 500 volts minimum.
 - 3) 16-bit analog-to-digital conversion having overall accuracy of less than 0.75% of full scale.
 - 4) 250 ohm input impedance (on 1-5 VDC input).
 - d. Analog outputs:
 - 1) 0 to 20 mADC range. Nominal span of 4-20 mADC, 4 channel.
 - 2) 15-bit digital-to-analog conversion having overall accuracy of less than +/- 0.75% of full scale.
 - 3) Capable of driving up to 750 ohm load.
 - e. Provide and minimum of 20% spare I/O wired to terminals for each type used.
3. Functional specifications:
 - a. Program memory: 2M words
 - b. 1 Gb memory card.
 - c. Standard RAM: Lithium battery, 2 years.
 - d. LED indicators: RUN, FAULT, FORCED I/O, BATTERY LOW.
 - e. Communication: (2) Ethernet , USB.

4. Environmental conditions:
 - a. Ambient temperature: Operating: 0°C to 60°C (32°F to 140°F). Storage: -40°C to 85°C (-40°F to 185°F).
 - b. Humidity: 5 to 95% (non-condensing).
 - c. Noise immunity: Comply with NEMA ICS-2-230.
 - d. Shock (operating): 30 Gs.
 - e. Vibration: Displacement: 0.015", peak-to-peak at 5-57 Hz. Acceleration: 2.5 Gs at 57-2000 Hz.
5. Programming techniques:
 - a. The programming format shall incorporate a traditional relay ladder diagram.
 - b. The capability shall exist to change a contact from normally open to normally closed, add instruction, change addresses, etc. without deleting or reprogramming the entire rung.
 - c. It shall be possible to insert relay ladder diagram rungs anywhere in the program, even between existing rungs, insofar as there is sufficient memory to accommodate these additions.
 - d. A single program command or instruction shall suffice to delete an individual ladder diagram rung from memory.
 - e. It shall not be necessary to issue a two-part command in order to delete all relay ladder rungs from memory. This will provide a safeguard wherein the operator must verify their intentions before erasing the entire program.
 - f. Isolate systems to limit domino failure (sub-routine).
6. Approved manufacturers:
 - a. Allen-Bradley. Model: CompactLogix 5069-L320ER processor with I/O modules, rack(s), power supply(s), accessories and options specified. PLC shall include 20% spare I/O wired to terminals and 30% rack expansion space.
 - b. Engineer approved equivalent.

2.06 SCADA SOFTWARE

- A. General:
 1. Programming modification to Owners existing Rockwell Factory Talk SCADA application is provided by Systems Integrator. System Integrator shall coordinate with Owner as required for removed equipment and information exchange as well as network addressing.

2.07 SUPPLEMENTAL PROGRAMMING HOURS

- A. General:
 1. Integrator to include 12 hours of supplemental programming hours in their bid.
 2. Supplemental programming hours to be used for PLC and OIT programming changes after start-up during the warranty period that are in addition to or changes from programming scope detailed above.
 3. Integrator to provide an estimate of hours for each requested programming change.
 4. Use of supplemental programming hours requires approval from the Owner/Engineer prior to performing work.
 5. Items **Not Included** in supplemental programming:
 - a. Travel Time
 - b. Travel Expense
 - c. Warranty Work and Corrections

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's recommendations and as indicated on Drawing.
- B. Units shall be installed and programmed by well qualified and experienced craftsmen and engineers/technicians. SCADA software system shall be designed and programmed by engineers/technicians.

- C. Units shall be properly interfaced with the input and output devices.
- D. Include all required-related items for a complete installation.

END OF SECTION 25 9100

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**SECTION 25 9110
INSTRUMENTATION AND CONTROL SCHEDULES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Instrumentation Schedule.
- B. Control Panel Schedule.

PART 2 PRODUCTS

2.01 INSTRUMENTATION SCHEDULE

- A. Magnetic Flowtube/Transmitter (wall mounted unless noted otherwise; flow indication in GPM unless noted otherwise):
 - 1. FIT/FE-1112 - 4" diameter; Range 0-500 GPM; WAS Flow to RDT.
 - 2. FIT/FE-1212 - 6" diameter; Range 0-500 GPM; Digested Sludge Flow to RDT.
 - 3. FIT/FE-1259- 6" diameter; Range 0-500 GPM; Thickened Digested Sludge Flow.
- B. Pressure/Level Transducer/Transmitter:
 - 1. PT-1132 - Range 0-3' ; RDT No. 1 Filtrate Pan Water Level. Provided by Section 46 7133 Supplier.
 - 2. PT-1140 - Range 0-3' ; Hopper No. 1 Sludge Level. Provided by Section 46 7133 Supplier.
 - 3. PT-1232 - Range 0-3' ; RDT No. 2 Filtrate Pan Water Level. Provided by Section 46 7133 Supplier.
 - 4. PT-1240 - Range 0-3' ; Hopper No. 2 Sludge Level. Provided by Section 46 7133 Supplier.
- C. Pressure Switch:
 - 1. PSL-1194 - Range (set by RDT manufacturer) psi; Booster Pump (BP-1190) Water Pressure. Provided by Section 46 7133 Supplier.
 - 2. PSL-1294 - Range (set by RDT manufacturer) psi; Booster Pump (BP-1290) Water Pressure. Provided by Section 46 7133 Supplier.
- D. Pressure Switch/Pressure Gauge/Isolation Ring Assembly:
 - 1. PSH/PI-1152 - Range (set by pump manufacturer) psi; TWAS Pump 1151 Discharge Pressure. Provided by Section 43 2114 Supplier.
 - 2. PSH/PI-1252 - Range (set by pump manufacturer) psi; TS Pump 1251 Discharge Pressure. Provided by Section 43 2114 Supplier.

2.02 CONTROL PANEL SCHEDULE

- A. Abbreviations:
 - 1. CP: Control Panel.
 - 2. MCP: Manufacturer's Control Panel.
 - 3. VCP: Ventilation Control Panel.
 - 4. (W): White.
 - 5. (G): Green.
 - 6. (R): Red.
 - 7. (A): Amber.
- B. MCP- 1130
 - 1. Description/Location: RDT NO. 1 Control Panel; RDT Room
 - 2. Provided by Section 46 7133 Supplier.
- C. MCP- 1230
 - 1. Description/Location: RDT NO. 2 Control Panel; RDT Room
 - 2. Provided by Section 46 7133 Supplier.
- D. CP-F
 - 1. Description/Location: Sludge Thickening Control Panel; RDT Room
 - 2. Panel Enclosure: NEMA 12, free standing (size as required-minimum 90"H x 36"W x 20"D)

3. Element Location: Front.
 - a. Operator Interface. (Existing relocated from SPCP-F)
 - b. Power On Pilot Light (W).
 - c. 2 WAS Pump OT Pilot Light (R)
 - d. 2 WAS Pump Seal Fail Pilot Light (R)
 - e. 2 WAS Pump OT/Seal Fail Reset Push Button
4. Element Location: Internal.
 - a. PLC: Medium with I/O.
 - b. Ethernet Switch - 8 Port .
 - c. 2 WAS Pump Protection Modules - supplied by Pump Supplier, installed by Integrator.
 - d. UPS.
 - e. Panel Surge Protection.
 - f. DC Power Supply.
 - g. IS Barriers.
 - h. Convenience Receptacle.
 - i. LED Enclosure Light and Door Switch.
 - j. Breakers, Fuses, Relays, Timers, Terminals, and Misc. as required.
 - k. Enclosure Filtered Fan Cooling (NEMA 12) and Heat as required.
- E. Existing SPCP-C Modifications
 1. Description/Location: Digester Control Panel; Digester Control Building, Lower Level
 2. Panel Enclosure: Existing.
 3. Element Location: Front.
 - a. None.
 4. Element Location: Internal.
 - a. Modify PLC I/O as required for removal of Digester Transfer Pump DTP-1050. Unused I/O shall become spare.
 - b. Breakers, Fuses, Relays, Timers, Terminals, and Misc. as required.
- F. Existing SPCP-L Modifications
 1. Description/Location: Boiler Building Control Panel; Electric Room
 2. Panel Enclosure: Existing.
 3. Element Location: Front.
 - a. None.
 4. Element Location: Internal.
 - a. Modify PLC I/O as required for addition of Digester Transfer Pump DTP-1050. Utilize spare I/O where available. Add analog I/O module as required.
 - b. Breakers, Fuses, Relays, Timers, Terminals, and Misc. as required.
- G. VCP- F
 1. Description/Location: RDT Building Ventilation Control Panel; RDT Room
 2. Panel Enclosure: NEMA 12, Wall Mount (size as required-minimum 24"H x 24"W x 8"D)
 3. Element Location: Internal.
 - a. 1 Control Breaker.
 - b. 1 Time Delay Relays and Relays as required.
 - c. 1 Terminal Strips as required.
 4. Element Location: Front.
 - a. 1 RDT Room MAU-1081 Failure indication light (R).
 - b. 1 RDT Room EF-1080 Failure indication light (R).
 - c. 1 Horn silence push button.
 - d. 1 H2 Alarm Horn.
 - e. 1 SL2 Alarm Beacon - Mounted to Top of Enclosure.
- H. MCP- 1081
 1. Description/Location: RDT Building MAU Control Panel; On Unit

2. Provided by Section 23 7433 Supplier
- I. LCP- 1081
 1. Description/Location: MAU Local Control Panel; RDT Room
 2. Provided by Section 23 7433 Supplier

PART 3 EXECUTION

3.01 INSTALLATION

- A. Include all required-related items for a complete installation.

END OF SECTION 25 9110

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**SECTION 25 9120
MEASUREMENT AND CONTROL COMMISSIONING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Start up, shake down, and training for instrumentation and control system.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Submittal shall contain:
 - 1. Identification of the respective responsibilities of each party to the project, including what is provided by the system manufacturer, what is to be subcontracted.
 - 2. Description of the major user related features and operating characteristics of the proposed system.
 - 3. Description of all master site hardware and software, including examples of digital displays, control loops, reports, and how the operator will interface with the system to achieve each specified function.
 - 4. Description and operation of all master configuration features of the I/O and local control loop characteristics.
 - 5. Describe the training program. An outline shall be provided that covers the basic software and hardware training, operator training, system maintenance training, and programming training. Identify the course content and the time spent on each subject area.
 - 6. Describe the startup implementation plan, participants' responsibilities and a schedule of events.
 - 7. All significant equipment to be supplied shall be listed, followed by descriptive data sheets. The equipment list shall include each component name, manufacturer, model number, a description of the operation, quantity supplied, and any special setup and operation and maintenance characteristics.
 - 8. Drawings of equipment to be supplied shall include as a minimum, overall dimensions and details for each unit, including installation arrangements, door mounted operator devices, and instruments. Wiring diagrams of all system components, including field device connections, shall be included and specific installation wiring responsibilities identified.
- C. Operations and maintenance manuals.

1.03 START-UP SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and the following.
- B. Provide for equipment installation check, calibrations, control adjustments, startups, and other services in the field by qualified service representative to produce complete working installation in compliance with drawings and specifications, satisfactory to Owner and Engineer.
- C. This field service is to cover both the separate mounted instrumentation involved in the system and the various control panels and components.
- D. Coordinate with General Contractor, Sub-Contractors and Equipment Suppliers to provide start-up services in concert with other equipment in the project.
- E. In addition to the field services, arrange for Owner training to be performed by the Manufacturer in the use and maintenance of all instrumentation and control system equipment supplied. Refer to scheduled training requirements.
- F. Provide complete start-up services until all systems are fully functional.
- G. Provide training program in sufficient depth that Owner can maintain and extend hardware/software functionality. Minimal courses shall include:
 - 1. Introduction to PLC/SCADA system:
 - a. Location: On-site.

- b. Timing: At first startup.
 - c. Length: 2 hours per session (1 session).
 - 2. Detailed system operating procedures:
 - a. Location: On-site.
 - b. Timing: During commissioning.
 - c. Length: 2 hours per session (1 session).
 - 3. SCADA reports:
 - a. Location: On-site.
 - b. Timing: After commissioning.
 - c. Length: 1 hours per session (1 session).
- H. On-site training:
 - 1. Classroom setting
 - 2. Oriented toward installed equipment and software.
 - 3. Taught by person with significant training experience.
 - 4. Instructor and course materials shall be approved in advance of training.
 - 5. Class size not to exceed 5 persons per PLC/SCADA systems sessions, 5 persons per SCADA report sessions.

1.04 ACCEPTANCE FOR OPERATION

- A. Owner will accept equipment and systems for operation when construction has been substantially completed by Contractor. "Acceptance for Operation" shall mean Owner will assume operational and routine maintenance duties. "Acceptance for Operation" does not relieve Contractor from responsibilities related to defective materials and workmanship; neither does it constitute final acceptance of materials and equipment.
- B. After Owner has accepted system for operation, Contractor shall continue to perform the following as requested and scheduled by Owner at no additional cost to Owner:
 - 1. Troubleshooting, adjustments, and repairs until system operation and performance is acceptable.
 - 2. Craft labor as required.
- C. After Owner has accepted system for operation, Contractor shall continue to supply technical services when needed until final acceptance. "Final Acceptance" shall mean Contractor compliance with specifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 START-UP

- A. No form of energy shall be turned on to any part of the instrumentation and control system prior to the receipt, by the Engineer, of written approval of the installation of equipment by the manufacturer.

3.02 TRAINING SCHEDULE

- A. Remote Device (eg: pressure transmitter, flow meter): Two hours on-site for each type of instrument.
- B. Control Panel: Two hours on-site for control panels.
- C. SCADA System: One hours on-site.
- D. Ethernet Network and Network Equipment: One hours on site.
- E. See paragraph 1.03 G through H of this Section for additional PLC/SCADA Training requirements.

END OF SECTION 25 9120

**SECTION 26 0500
BASIC ELECTRICAL MATERIALS AND METHODS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Basic Electrical Requirements specifically applicable to Division 26.

1.02 GENERAL REQUIREMENTS

- A. The general provisions of this Section apply to the other Division 26 sections.
- B. The work shall include the furnishing of systems, equipment and materials specified in this Division and as called for on the Drawings, to include: supervision, operation, methods and labor for the fabrication, installation, startup and tests for the complete electrical installation.
- C. Drawings for the Work are diagrammatic, intended to convey the scope of the Work and to indicate the general arrangement and locations of the Work. Because of the scale of the Drawings, certain basic items such as connectors, fittings, access panels, pullboxes, etc. are not necessarily shown. Where such items are required for proper installation of the Work, such items shall be included.
- D. Equipment specifications may not deal individually with minute items required such as components, parts, controls and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required, they shall be included by the supplier of the equipment, whether or not specifically called for.
- E. Where noted on the Drawings or where called for in other sections of the Specifications the Contractor shall install equipment under this Contract and shall make required electrical connections. Contractor shall verify with the supplier of the equipment the requirements for the installation.

1.03 WORK BY OTHERS

- A. The Owner may award contracts which will run concurrent to the Work.
 - 1. See notes on plans for extent of Division 26 participation.

1.04 OWNER FURNISHED PRODUCTS

- A. Products furnished to the site and paid for by Owner shall be as noted on Drawings.

1.05 CONTINUITY OF SERVICE

- A. Coordinate Work to accommodate Owner's occupancy requirements during the construction period. Refer to Section 01 1000 - Summary for additional requirements.

1.06 ACTIVE SERVICES

- A. Existing active services: water, gas, sewer, electric, when encountered, shall be protected against damage. Do not prevent or disturb operation of active services which are to remain. If active services are encountered which require relocation, make request to authorities having jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the Utility or Municipality having jurisdiction.

1.07 EXISTING SERVICE

- A. If existing services are encountered in the Work, protect, brace, and support existing active sewers, gas, electric, or other services where required for the proper execution of the Work. If existing active services are encountered that require relocation, make request to proper authorities for determination of procedure. Do not prevent or disturb operation of active services that are to remain.

1.08 TEMPORARY SHUTDOWNS OR ABANDONED SERVICES

- A. Where the Work makes temporary shutdowns or need to abandon unavoidable, Contractor shall consult with the Owner as to times and procedures for such shutdowns. Where existing services are to be abandoned, wiring shall be removed and conduit shall be properly capped in conformance with requirements of the Utility.

1.09 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Proposed Products List: Include Products specified in all Sections. Include individual components and equipment as their own line items. For each line item, include at a minimum:
 - 1. Unique line identifier.
 - 2. Equipment tag, where applicable, as defined on the drawings.
 - 3. Equipment description
 - 4. Manufacturer.
 - 5. Complete model or part number.
 - 6. Quantity.
- C. Submittal data for electrical equipment shall consist of shop drawings and/or catalog cuts showing technical data necessary to evaluate the material or equipment, to include power requirements (wattage, voltage, amperage, power factor, etc.) dimensions, wiring diagrams, performance curves, ratings, (electrical, environmental, etc.), control sequences and other descriptive data necessary to describe fully the item proposed and its operating characteristics. Shop drawings shall be submitted for equipment and materials as directed in individual sections. Mark dimensions and values in units to match those specified.
- D. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.
- E. Operation and Maintenance Manuals: Prepare and submit Operation and Maintenance manuals as described in Division 1 and related sections in Division 26.
- F. Submittal PDFs shall include bookmarks to the title page, table of contents, proposed products list (bill of materials), and all equipment and components within the submittal. Where multiple documents are present for a line item in the proposed products list, each shall be a subordinate bookmark to the main bookmark for the item.
- G. The Engineer will review shop drawings to aid in interpreting the Contract Documents, and will in so doing assume that the shop drawings conform to all specified requirements set forth in the Contract Documents. The review of the shop drawing by the Engineer does not relieve the Contractor of the responsibility of complying with all elements of the Contract Documents.

1.10 REGULATORY REQUIREMENTS

- A. Imposed Standards/Regulations:
 - 1. General: Applicable provisions of the following codes and standards are hereby imposed on a general basis for the electrical work in addition to specific applications specified by individual work sections of the Specifications.
 - a. American National Standards Institute (ANSI).
 - b. Institute of Electrical and Electronics Engineers (IEEE).
 - c. InterNational Electrical Testing Association (NETA).
 - d. Local and State Electrical, Mechanical and Building Codes as they apply.
 - e. Nation Electrical Contractors Association (NECA).
 - f. National Electrical Manufacturers Association (NEMA).
 - g. National Fire Protection Agency (NFPA), including but not limited to:
 - 1) NFPA 70 - National Electrical Code (NEC).
 - 2) NFPA 70E - Standard for Electrical Safety in the Workplace.
 - h. Underwriters Laboratories (UL).

2. Every installation shall also comply with applicable Divisions and Sections of this Specification. If changes are required to attain compliance, the Contractor shall submit the proposed changes to the Engineer for review and approval. If approval for the change is obtained, revised submittal data shall be provided for review.
 3. Installations must be safe in every respect, and must not create any condition which will be harmful to building occupants, operating personnel, installation personnel, testing personnel, construction workers, and general public. If Contractor believes that the installation will not be safe for all parties, the Contractor shall so report in writing to the Engineer, stating the issues and conditions and possible remedies, before any equipment is purchased or installed.
 4. The manufacturer of each type of equipment, used by itself or as a part of any system, shall carefully check capacities, arrangements, and methods shown or specified (including space requirements, servicing requirements, ambient air temperatures, etc.) for installation of the equipment, and all connections to other system or to parts of same system to assure that when used, connected, interconnected, piped, wired, or controlled as specified, the equipment can be properly serviced. If the manufacturer has any reservations in this regard, the manufacturer shall state such reservations and any suggested changes to the Engineer as a part of the shop drawing submission.
 5. Engineer will work out required changes and adjustments in Contract Prices where such adjustments are warranted. No adjustments in Contract Price will be allowed for additions required by applicable code, ordinance, statute, utility regulation, or labor regulation. It is the obligation of the Contractor to include such items in the original Bid. Changes in equipment shall be incorporated in shop drawings. If Contractor fails to call such reservations or suggestions to Engineer's attention, in writing, before any work is done or equipment is purchased, it will be assumed that the Contractor accepts responsibility for providing a completely safe and completely coordinated installation. If at a later date changes become necessary to assure a completely safe and coordinated installation, they shall be made, as approved by Engineer, without increase in Contract Price.
- B. Permits and Tests, Electrical Work: Unless otherwise noted in the detailed contractual description preceding these technical specifications, the Contractor shall secure all permits and pay all fees required in connection with this installation and shall be responsible for securing such inspections as are required by the authorities with jurisdiction over the site. Submit a record copy to the Owner and the Engineer of electrical work notices, permits, licenses, inspection or test reports, and similar items obtained in response to governing and imposed regulations and standards.

1.11 PROJECT CONDITIONS

- A. Inspect site prior to bidding to be thoroughly familiar with existing conditions.
- B. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- C. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Engineer before proceeding.
- D. All Contractors shall familiarize themselves with the site and with any conditions of the site and/or existing buildings which might present unusual aspects to the work involved. Contractor shall verify all aspects of electrical work, insofar as is possible, check routes of conduit indicated, verifying clearances and other obstacles which might influence the construction proposed. No extras can be allowed on work occasioned by the Contractor's failure to make this inspection.

1.12 SEQUENCING AND SCHEDULING

- A. Install work to accommodate Owner's occupancy requirements during construction period and coordinate electrical schedule and operations with Owner.
- B. Construct Work in sequence under provisions of Division 1 - General Requirements and other Sections as applicable.
- C. Completion of Electrical Work shall be coordinated with other trades and contractors to expedite completion of the Project.

- D. The Contractor shall coordinate the placing of openings in the structures as required for the installation of the Electrical Work.
- E. It will be the Contractor's responsibility to examine the Drawings and Specifications, to take measurements where required, to verify dimensions for correct placement of equipment and to progress the Contract as expeditiously as possible, so that the progress of the work is orderly and does not cause unnecessary cutting and patching of the structure. The Contractor shall be pecuniarily responsible for the cutting and patching of the structure occasioned by failure to install sleeves, grilles or other items required by the Electrical Work at the proper time for the normal installation of such items.
- F. The Contractor shall provide cutting and patching and patch painting of the structure, as required for the installation of the Work, and shall furnish lintels and supports as required for openings. Cutting of structural support members will not be permitted without prior approval of the Engineer. Extent of cutting shall be minimized; use core drills, power saws or other machines which will provide neat, minimum openings. Patching shall match adjacent materials and surfaces and shall be performed by craftsmen skilled in the respective craft required.
- G. The determination of quantities of material and equipment required shall be made by the Contractor from the Contract Documents. Schedules on the Drawings and in the Specifications are completed as an aid to the Contractor but where discrepancies arise, the greater number shall govern.

1.13 OPENINGS, CUTTING, AND PATCHING

- A. The Contractor shall coordinate the placing of openings in structures, as required, for the installation of the Electrical Work.
- B. The Contractor shall coordinate the accurate locations and sizes for required openings, and shall have the responsibility of checking to assure that proper size openings are provided. When additional patching is required due to the Contractor's failure to inspect the work, then the Contractor shall make arrangements for the patching required to properly close the openings, to include patch painting, and the Contractor shall pay any additional cost incurred in this respect.
- C. When cutting and patching of the structure is made necessary due to the Contractor's failure to install conduit wiring or equipment on schedule, or due to the Contractor's failure to furnish, on schedule, the information required for the leaving of openings, then it shall be the Contractor's responsibility to make arrangements for the cutting and patching and the Contractor shall pay any additional cost incurred in the correction.
- D. The Contractor shall provide cutting, patching and patch painting as required for the installation of Work in existing structures, and shall furnish lintels and supports as required for openings.
- E. Cutting of structural support members will not be permitted without prior approval of the Engineer. Extent of cutting shall be minimized; use core drills, power saws or other machines which will provide neat, minimum openings. Patching shall match adjacent materials and surfaces and shall be performed by craftsmen skilled in the respective craft required.

1.14 FUTURE WORK

- A. Provide for future work as noted on plans.

1.15 CONCRETE WORK

- A. The Contractor shall coordinate size and location of concrete bases and pads for electrical equipment with the required trades and with the Utility.
- B. The Contractor shall furnish equipment anchor bolts and shall be responsible for their proper installation and accurate location.

1.16 WIRING FOR ELECTRICAL EQUIPMENT

- A. The Contractor will provide power services for motors and equipment furnished by the Mechanical Contractor to include safety disconnect switches and final connections.

- B. The Contractor will be responsible for power wiring, internal wiring, alarm wiring, control wiring or interlock wiring of all equipment installed or modified under this Contract.
- C. The Contractor will furnish motor starters for motors furnished by the Mechanical Contractor, except where other Sections call for starters to be furnished by the Mechanical Contractor.
- D. The Contractor shall review the Drawings and shall call to the attention of the Engineer, prior to bidding, omissions of electrical services required for equipment in these specifications.

1.17 PROTECTION

- A. Special care shall be taken for the protection of equipment furnished by the Contractor. Equipment and material shall be completely protected from weather elements, painting, plaster, etc. until the Project is completed. Damage from rust, paint, scratches, etc. shall be repaired as required to restore equipment to original condition.
- B. Protection of equipment during the plastering and painting of the building shall be the responsibility of the Contractor performing that work, but this shall not relieve the Contractor of the responsibility of checking to assure that adequate protection is being provided.
- C. Where the installation or connection of equipment requires the Contractor to work in areas previously finished, the Contractor shall be responsible that such areas are protected and are not marred, soiled or otherwise damaged during the course of such work. The Contractor shall repair and refinish such areas which were damaged due to work performed by the Contractor.
- D. When heavy materials must be placed upon or transported over the roof deck, sheeting shall be placed to distribute weight and support such materials.

1.18 FINISHING

- A. Prior to acceptance of the installation and final payment of the Contract, the Contractor shall perform the work outlined herein.
- B. Perform cleaning required by Division 1 applicable to this Division of the Work. Cleaning shall include removing debris and dirt from panels, pull boxes, junction boxes, and other enclosures.

1.19 TEST AND DEMONSTRATIONS

- A. Systems shall be tested and placed in proper working order prior to demonstrating systems to Owner.
- B. Prior to acceptance of the electrical installation, the Contractor shall demonstrate to the Owner or designated representatives all essential features and functions of all systems installed, and shall instruct the Owner in the proper operation and maintenance of such systems.
- C. Contractor shall furnish the necessary trained personnel to perform the demonstrations and instructions and shall arrange to have the manufacturer's representatives for the system present to assist with the demonstrations. The Owner and Contractor shall each sign a certification stating that the training has been performed and the Owner accepts same.
- D. Tests shall be performed according to NETA Acceptance Testing Standards, as applicable, and as specified in these specifications.

1.20 PAINTING AND IDENTIFICATION

- A. Painting of electrical enclosures (switch/outlet boxes, starters, disconnects, control cabinets and panelboards) shall be touch-up only of factory finish or finish specified elsewhere.
- B. Conduit and raceway systems shall be unpainted unless specifically noted. If painting of conduit and raceway systems is required, coat with paint type and color to match background mounting surface.
- C. See Section 26 0553 Identification for Electrical Systems for additional requirements.
- D. Identify panels, switchgear, starters, switches, valves and dampers with engraved nameplates.
- E. Provide typed panel and switchboard schedules.

- F. Identify conduit piping systems in boiler rooms, equipment rooms, tunnels, and pipe shafts with Brady or Seton color coded markers. Markers shall be affixed to conduits at intervals not exceeding 30 feet.
- G. Provide plastic "Buried Electrical" warning tape in trench above all underground circuit runs. Place approximately 18 inches below finished grade.

1.21 PRODUCT QUALITY, PERFORMANCE, AND SUBSTITUTIONS

- A. All materials shall be the standard product of a reputable manufacturer regularly engaged in the manufacture of the specific product, and where more than one unit is required of the item, all shall be of the same manufacturer.
- B. Proposals as submitted shall be based on the products specifically named in the specifications.
- C. If specific products of more than one manufacturer are specified, the choice of these shall be made optional with the Contractor.
- D. All materials are subject to approval by the Engineer both before and after incorporation in the building.
- E. Should suppliers of materials not specified wish to bid their material as a base bid equal, they shall secure the written approval of the Engineer that their product is acceptable as an equal to that specified at least ten (10) days in advance of the bid date to have their products covered in an Addendum prior to opening of bids.
- F. The Engineer reserves the right to refuse approval on equipment which does not meet the specification. Any materials not conforming to the specification may be ordered removed any time during the course of construction, and the Contractor shall replace such items, when notified, at the Contractor's expense. The Engineer further reserves the right to reject equipment for which the availability of maintenance service and replacement parts is questionable.
- G. All materials and equipment shall be new. Second-hand, used, or salvaged equipment will not be allowed unless specifically noted.
- H. All elements of the construction shall be performed by workmen skilled in the particular craft involved, and regularly employed in that particular craft. All work shall be performed in a neat, workmanlike manner in keeping with the highest standards of the craft.
- I. The Engineer reserves the right to determine space priority of the equipment in the event of interference between the piping and equipment of the various installations. Conflicts between the Drawings and Specifications, or between requirements set forth for the various trades shall be called to the attention of the Engineer. If clarification is not asked for prior to the taking of bids, it will be assumed that none is required and that the Contractor has submitted the bid in conformance with Contract Documents as issued.

1.22 EXCAVATING, TRENCHING AND BACKFILLING

- A. The Contractor shall do excavating necessary for underground electrical ducts, wiring, manholes, conduit, etc., and shall backfill such trenches and excavations after equipment has been installed and tested. Care shall be taken in excavating, that walls and footings and adjacent load bearing soils are not disturbed, except where lines must cross under a wall footing. Where a line must pass under footing, the crossing shall be made by the smallest possible trench to accommodate the pipe.
- B. Excavation shall be kept free from water by pumping if necessary. No greater length of trench shall be left open, in advance of pipe and utility laying, than necessary.
- C. Immediately after testing and/or inspection, the trench shall be carefully backfilled. Place backfill into trench so the impact on installed pipe is minimized. Backfill and compact to specifications described in Division 31 for utility trenching.

1.23 COORDINATION

- A. Where the Contract Documents state that equipment shall be "furnished", "installed", or "provided", it shall be understood to mean the Contractor shall furnish and install completely unless otherwise noted.

1.24 SITE

- A. The site shall be kept orderly and clean at all times during the construction, and the storing of materials shall be in accordance with the requirements of the Owner in areas designated for that purpose. At the conclusion of the construction, the site shall be cleaned thoroughly of all rubble, debris and unused materials and shall be left in good order. All tunnels, chases or closed off spaces shall be cleaned of all waste materials, wood frame members, etc. used in construction.

1.25 NOISE AND VIBRATION

- A. Electrical equipment shall operate without objectionable noise or vibration as determined by the Engineer. If such objectionable noise or vibration should be produced and transmitted to occupied portions of the building by apparatus, conduit, ducts or other parts of the electrical work, the Contractor shall make necessary changes and additions, as approved by the Engineer.

1.26 EQUIPMENT INSTALLATION

- A. Install in accordance with applicable NECA requirements.
- B. Erect equipment in neat and workmanlike manner, align, level and adjust for satisfactory operation, install so that connecting and disconnecting parts can be made readily and so that all parts are easily accessible for inspection, operation and maintenance.

1.27 APPLICATIONS

- A. Where applications are required for the procuring of utility service to the building, the Contractor shall see that such application is properly filed with the Utility and that all information required for such an application is presented to the extent and in the form required by the Utility Company.

1.28 RECORD UTILITIES DRAWINGS

- A. Contractor shall prepare and submit to Engineer drawings showing the exact location of all installed underground electrical and conduit runs and any existing underground utilities encountered during installation. The drawings shall give accurate locations (referenced to visible above-grade objects) and dimensions of all such equipment for future use by the Owner. These drawings shall be submitted to the Engineer as soon as practicable after such runs have been installed.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 26 0500

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**SECTION 26 0505
SELECTIVE DEMOLITION FOR ELECTRICAL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical demolition.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual sections or as required to complete work.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as indicated.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents.
- D. Report discrepancies to Engineer before disturbing existing installation.
- E. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
 - 1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
 - 2. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
 - 1. PCB-containing electrical equipment, including transformers, capacitors, and switches.
 - 2. PCB- and DEHP-containing lighting ballasts.
 - 3. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- F. Disconnect and remove abandoned panelboards and distribution equipment.

- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- I. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- J. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.04 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment that remain or that are to be reused.

END OF SECTION 26 0505

SECTION 26 0519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Single conductor building wire.
- B. Cable seal (gland) fittings.
- C. Control and signal cable.
- D. Wire and cable for 600 volts and less.
- E. Wiring connectors.
- F. Electrical tape.
- G. Heat shrink tubing.
- H. Oxide inhibiting compound.
- I. Wire pulling lubricant.
- J. Cable ties.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire.
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes.
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation.
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape.
- F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes.
- G. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- H. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.
- I. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- J. NFPA 70 - National Electrical Code.
- K. UL 44 - Thermoset-Insulated Wires and Cables.
- L. UL 83 - Thermoplastic-Insulated Wires and Cables.
- M. UL 267 - Outline of Investigation for Wire-Pulling Compounds.
- N. UL 486A-486B - Wire Connectors.
- O. UL 486C - Splicing Wire Connectors.
- P. UL 486D - Sealed Wire Connector Systems.

Q. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate the installation of direct burial cable with other trades to avoid conflicts with piping or other potential conflicts.
 - 3. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
 - 4. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Provide for each cable assembly type.
- C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.
- D. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Alan Wire Company
- B. Belden, Inc.
- C. Cablec.
- D. Carroll.
- E. Southwire Company.
- F. Triangle.
- G. Engineer approved equivalent.

2.02 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. All conductors/circuits shall be copper conductor. Use of aluminum conductors shall not be allowed unless specifically noted.

- D. All circuits shall be installed as building wire, control wire, or signal cable in raceway unless specifically noted or indicated on the Drawings.
- E. Use conductor not smaller than #12 AWG for power and lighting circuits.
- F. Use conductor not smaller than #14 AWG for control circuits.

2.03 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductors for Grounding and Bonding: Also comply with Section 26 0526.
- H. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.
- I. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.
 - a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
 - 3. Color Code:
 - a. 480Y/277 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral/Grounded: Gray.
 - b. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - c. Equipment Ground, All Systems: Green.
 - d. Travelers for 3-Way and 4-Way Switching: Pink.
 - e. For control circuits, comply with manufacturer's recommended color code.

2.04 SINGLE CONDUCTOR BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
 - 1. Feeders and Branch Circuits: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Insulation:
 - 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

- a. Size 4 AWG and Larger: Type XHHW-2.
- b. Installed Underground: Type XHHW-2.
- c. Between VFD outputs and motors: Type XHHW-2, unless specifically indicated otherwise.

E. All wire routed through underground raceway shall be listed for wet location.

2.05 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 26 0526.
- C. Wiring Connectors for Splices and Taps:
 - 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
 - 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
 - 1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
 - 2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
 - 3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
 - 4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
 - 5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
 - 6. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
 - 7. Conductors for Control Circuits: Use crimped terminals for all connections.
- E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
- F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
- H. Mechanical Connectors: Provide bolted type or set-screw type.
- I. Compression Connectors: Provide circumferential type or hex type crimp configuration.
- J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.

2.06 ACCESSORIES

- A. Electrical Tape:
 - 1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
 - 2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.

3. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
 4. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.
 5. Varnished Cambric Electrical Tape: Cotton cambric fabric tape, with or without adhesive, oil-primed and coated with high-grade insulating varnish; minimum thickness of 7 mil; suitable for continuous temperature environment up to 221 degrees F.
 6. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.
- B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
- C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.
- D. Wire Pulling Lubricant:
1. Listed and labeled as complying with UL 267.
 2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
 3. Suitable for use at installation temperature.
- E. Cable Ties: Material and tensile strength rating suitable for application.
- F. Cable Seal (Gland) Fittings:
1. Appleton PX2KX for Class I, Division 1 areas or Engineer-Approved Equal.
- G. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for cables and roofing system to be installed; designed to accommodate existing penetrations where applicable.

2.07 CONTROL AND SIGNAL CABLE

- A. Cable for Discrete Control Signals:
1. Single conductor, #14AWG stranded copper, type THHN/THWN insulation.
- B. Signal Cable for Analog Control Signals:
1. One twisted shielded pair #18 AWG, 300V - Belden 8760 or equal.
 2. One shielded triad (3-conductors), #18 AWG, 300V - Belden 8770 or equal.
- C. Ethernet Cable: Category 6 compliant.
1. Plan Mark DSC1: Belden 7927A.

2.08 CORDS

- A. Oil-resistant thermoset insulated multiconductor flexible cord with identified equipment grounding conductor, suitable for extra-hard usage in damp locations.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that raceway installation is complete and supported.
- E. Verify that field measurements are as indicated.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Verify conduit systems are ready to accept cables.
- B. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

- A. Circuiting Requirements:
 - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 - 2. When circuit destination is indicated without specific routing, determine exact routing required.
 - 3. Arrange circuiting to minimize splices.
 - 4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
 - 5. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.
 - 6. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
- G. Install conductors with a minimum of 12 inches of slack at each outlet.
- H. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- I. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- J. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
 - 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- K. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
 - 1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
 - a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.

- b. For taped connections likely to require re-entering, including motor leads, first apply varnished cambric electrical tape, followed by adequate amount of rubber splicing electrical tape, followed by outer covering of vinyl insulating electrical tape.
- 2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
 - a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
 - b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.
- 3. Wet Locations: Use heat shrink tubing.
- L. Insulate ends of spare conductors using vinyl insulating electrical tape.
- M. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.
- N. Identify conductors and cables in accordance with Section 26 0553.
- O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified.
- P. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.
- Q. Install wire and cable securely, in a neat and workmanlike manner, as specified in NECA 1.
- R. All interconnecting circuit wires or cables (power and control) shall be tagged with an appropriate numbering system that assigns a unique identification to the wire or cable that is compatible with the tagging system of the connected equipment. Tags shall be applied at all junctions and terminations of each wire or cable.
- S. Install a waterproof sealant (such as silicone rubber) in conduits connected to control valves, instrumentation, and other electrical power and control devices mounted directly to water piping. Inject sealant near end of flexible conduit connected to device. Install sealant after all power and control conductors have been installed and operation of equipment has been verified.
- T. Conductors shall be terminated on screw or compression lug terminals. Conductor runs shall not be spliced between points of termination unless specified or approved by the Engineer.
- U. Route wire and cable as required to meet project conditions.
- V. Pull all conductors into raceway at same time.
- W. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- X. Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.
- Y. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- Z. Clean conductor surfaces before installing lugs and connectors.
- AA. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- BB. Terminate spare conductors with electrical tape and label as such.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Perform field inspection and testing in accordance with Section 01 4000.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing.
Replace SPDs damaged by performing high potential testing with SPDs connected.
- D. Correct deficiencies and replace damaged or defective conductors and cables.
- E. Panelboards, MCC, and switchboard feeder cables shall be Meggared to verify the insulation was not damaged during installation.

END OF SECTION 26 0519

SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.
- D. Ground rod electrodes.
- E. Wire, components, and miscellaneous equipment in supplying and installing electrical grounding systems.
- F. Provide all components necessary to complete the grounding system(s) consisting of:
 - 1. Metal underground water pipe.
 - 2. Ground rings.
 - 3. Rod electrodes.

1.02 RELATED REQUIREMENTS

- A. Section 26 0519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES:
Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- B. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings.
- C. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- D. NFPA 70 - National Electrical Code.
- E. UL 467 - Grounding and Bonding Equipment.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify exact locations of underground metal water service pipe entrances to building.
 - 2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
 - 3. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.05 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 5 ohms.

1.06 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittals procedures.
- B. Product Data: Provide data for grounding electrodes and connections.
- C. Project Record Documents: Record actual locations of grounding electrode system components and connections.
- D. Project Record Documents: Record actual locations of components and grounding electrodes.

1.07 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.09 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

- A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
- B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- E. Grounding Electrode System:
 - 1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
 - a. Provide continuous grounding electrode conductors without splice or joint.
 - b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
 - 2. Metal Underground Water Pipe(s):
 - a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet at an accessible location not more than 5 feet from the point of entrance to the building.
 - b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
 - c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
 - 3. Metal In-Ground Support Structure:
 - a. Provide connection to metal in-ground support structure that is in direct contact with earth in accordance with NFPA 70.
 - 4. Concrete-Encased Electrode:
 - a. Provide connection to concrete-encased electrode consisting of not less than 20 feet of either steel reinforcing bars or bare copper conductor not smaller than 4 AWG embedded within concrete foundation or footing that is in direct contact with earth in accordance with NFPA 70.
 - 5. Ground Ring:
 - a. Provide a ground ring encircling the building or structure consisting of bare copper conductor not less than #4/0 in direct contact with earth, installed at a depth of not less than 30 inches.
 - b. Provide connection from ground ring conductor to:
 - 1) Perimeter columns of metal building frame.

- 2) Ground rod electrodes located as indicated.
6. Ground Rod Electrode(s):
 - a. Provide ground rods where indicated on the drawings.
 - b. Space electrodes not less than 10 feet from each other and any other ground electrode.
 - c. Where location is not indicated, locate electrode(s) at least 5 feet outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
 - d. Provide ground access well where indicated..
- F. Grounding for Separate Building or Structure Supplied by Feeder(s) or Branch Circuits:
 1. Provide grounding electrode system for each separate building or structure.
 2. Provide equipment grounding conductor routed with supply conductors.
 3. For each disconnecting means, provide grounding electrode conductor to connect equipment ground bus to grounding electrode system.
 4. Do not make any connections and remove any factory-installed jumpers between neutral (grounded) conductors and ground.
- G. Separately Derived System Grounding:
 1. Separately derived systems include, but are not limited to:
 - a. Transformers (except autotransformers such as buck-boost transformers).
 2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.
 3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.
 4. Outdoor Source: Where the source of the separately derived system is located outside the building or structure supplied, provide connection to grounding electrode at source in accordance with NFPA 70.
 5. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.
 6. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.
- H. Bonding and Equipment Grounding:
 1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
 2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
 3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
 4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
 5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
 6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
- I. Lightning Protection Systems:
 1. Do not use grounding electrode dedicated for lightning protection system for component of building grounding electrode system provided under this section.

2. Provide bonding of building grounding electrode system provided under this section and lightning protection grounding electrode system in accordance with NFPA 70 and NFPA 780.

2.02 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
 1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.
 - 2) Use bare copper conductors where directly encased in concrete (not in raceway).
- C. Connectors for Grounding and Bonding:
 1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
 3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.
- D. Ground Rod Electrodes:
 1. Comply with NEMA GR 1.
 2. Material: Copper-bonded (copper-clad) steel.
 3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.
- E. Ground Access Wells:
 1. Description: Open bottom round or rectangular well with access cover for testing and inspection; suitable for the expected load at the installed location.
 - a. Areas Exposed to Vehicular Traffic: Rated for not less than H20 loading vertical design load.
 2. Size: As required to provide adequate access for testing and inspection, but not less than minimum size requirements specified.
 - a. Round Wells: Not less than 8 inches in diameter.
 - b. Rectangular Wells: Not less than 12 by 12 inches.
 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 10 inches.
 4. Cover: Factory-identified by permanent means with word "GROUND".
 5. Manufacturers:
 - a. Harger Lightning & Grounding: www.harger.com/#sle.
 - b. nVent ERICO: www.nvent.com/#sle.
 - c. Advanced Lighting Technology (ALT): www.altfab.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.

2.03 MANUFACTURERS

- A. Thomas & Betts.
- B. Erico.
- C. Cooper Power Systems, a division of Cooper Industries: www.cooperindustries.com.
- D. Framatome Connectors International: www.fciconnect.com.
- E. Engineer approved equivalent.

2.04 CONDUCTORS/WIRE

- A. Material: Copper.

- B. Grounding electrode conductors and bonding jumpers:
 - 1. Sizes #8 AWG and smaller: Bare solid conductor.
 - 2. Sizes #6 AWG and larger: Bare stranded conductor.
- C. Equipment grounding conductors:
 - 1. Stranded, insulated.
- D. Size conductors as indicated on the Drawings. If no size is indicated, size conductors to meet NFPA 70 requirements.

2.05 CONNECTORS AND ACCESSORIES

- A. Compression Crimp Connectors: Copper.
- B. Mechanical Connectors: Bronze.
- C. Exothermic Connectors: Exothermic charges and molds as required for various configurations.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Verify existing conditions prior to beginning work.
- E. Verify final length and location of ground conductors.
- F. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70.
 - 1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches below finished grade.
 - 2. Indoor Installations: Unless otherwise indicated, install with 4 inches of top of rod exposed.
- D. Make grounding and bonding connections using specified connectors.
 - 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 - 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 - 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
 - 4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- E. Identify grounding and bonding system components in accordance with Section 26 0553.
- F. Install Products in accordance with manufacturer's instructions.
- G. Refer to grounding details on Drawings.

- H. Install ground electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.
- I. Provide bonding to meet requirements described in Quality Assurance.
- J. Equipment Grounding Conductor: Provide an equipment grounding conductor with each feeder and branch circuit regardless of raceway type. Terminate each end on suitable lug, bus, or bushing.
- K. Concealed connections such as those underground or buried inside inaccessible wall or ceiling spaces shall be compression crimp or exothermic type. Mechanical connections shall be for exposed or readily accessible connections only.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- C. Inspect and test in accordance with NETA ATS except Section 4.
- D. Perform inspections and tests listed in NETA ATS, Section 7.13.
- E. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
- F. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION 26 0526

**SECTION 26 0529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.
- B. Anchors and fasteners.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 26 0533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
- C. Section 26 0533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- D. MFMA-4 - Metal Framing Standards Publication.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- F. NFPA 70 - National Electrical Code.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes and arrangement of supports and bases with actual equipment and components to be installed.
 - 2. Coordinate work to provide additional framing and materials required for installation.
 - 3. Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.
 - 4. Coordinate arrangement of supports with ductwork, piping, equipment and other potential conflicts.
 - 5. Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install products on or provide attachment to concrete surfaces until concrete has cured; see Section 03 3000.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06 DESCRIPTION

- A. Description: Steel channel, fittings, and anchors used to support various electrical devices and equipment racks.

1.07 QUALITY ASSURANCE

- A. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Materials and components shall be inspected for damage and physical defects.
- B. Materials and components shall be stored in accordance with manufacturer's recommendations.

1.09 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Comply with the following. Where requirements differ, comply with most stringent.
 - a. NFPA 70.
 - b. Requirements of authorities having jurisdiction.
 - 2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
 - 3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
 - 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 - 6. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
 - 7. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
 - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - b. Outdoor, Corrosive and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
 - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
- C. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.
- D. Metal Channel/Strut Framing Systems:
 - 1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
 - 2. Comply with MFMA-4.
 - 3. Channel Material:
 - a. Indoor Dry Locations: Use zinc-plated steel or galvanized steel.
 - b. Outdoor, Corrosive and Damp or Wet Indoor Locations: Use stainless steel.
- E. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.

F. Anchors and Fasteners:

1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.
2. Concrete: Use preset concrete inserts, expansion anchors, screw anchors, or adhesive anchors.
3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
4. Hollow Masonry: Use toggle bolts.
5. Hollow Stud Walls: Use toggle bolts.
6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
7. Sheet Metal: Use sheet metal screws.
8. Wood: Use wood screws.
9. Preset Concrete Inserts: Continuous metal channel/strut and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - a. Manufacturer: Same as manufacturer of metal channel/strut framing system.
 - b. Comply with MFMA-4.
 - c. Channel Material: Use stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install hangers and supports in accordance with NECA 1.
- C. Install anchorage to concrete and masonry per Division 5 specifications and details on Drawings
- D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- E. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support system or ceiling grid.
- F. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.
- G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- H. Equipment Support and Attachment:
 1. Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as required.
 2. Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 3. Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 4. In wet and damp locations use stainless steel channel supports to stand cabinets, conduits, and panelboards ¼" off wall.
 5. Unless otherwise indicated, mount floor-mounted equipment on properly sized concrete pad 4 inches in height; see Section 03 3000.
 6. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- I. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.
- J. Secure fasteners in accordance with manufacturer's recommended torque settings.

- K. Remove temporary supports.
- L. Fabricate supports from structural steel or steel channel. Rigidly weld support members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- M. Install surface-mounted cabinets and panelboards with minimum of four anchors.

3.03 FIELD QUALITY ASSURANCE

- A. Verify all supports are securely anchored and fastened.
- B. Verify all supports are level and square.

END OF SECTION 26 0529

**SECTION 26 0533.13
CONDUIT FOR ELECTRICAL SYSTEMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Galvanized steel rigid metal conduit (RMC).
- B. PVC-coated galvanized steel rigid metal conduit (RMC).
- C. Flexible metal conduit (FMC).
- D. Liquidtight flexible metal conduit (LFMC).
- E. Rigid polyvinyl chloride (PVC) conduit.
- F. Conduit, fittings and conduit bodies.
- G. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete encasement of conduits.
- B. Section 26 0519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES: Cable assemblies consisting of conductors protected by integral metal armor.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- D. Section 26 0529 - Hangers and Supports for Electrical Systems.
- E. Section 26 0533.16 - Boxes for Electrical Systems.
- F. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC).
- B. ETL PVC-001 - Adhesion Performance for Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT).
- E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC).
- F. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Metal Conduit and Intermediate Metal Conduit.
- G. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit.
- H. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing.
- I. NFPA 70 - National Electrical Code.
- J. UL 1 - Flexible Metal Conduit.
- K. UL 6 - Electrical Rigid Metal Conduit-Steel.
- L. UL 360 - Liquid-Tight Flexible Metal Conduit.
- M. UL 514B - Conduit, Tubing, and Cable Fittings.
- N. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings.
- O. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations.
- P. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit.
- Q. UL 2419 - Outline of Investigation for Electrically Conductive Corrosion Resistant Compounds.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
 - 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
 - 4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
 - 5. Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittals procedures.
- B. Product Data: Provide for conduit.

1.06 QUALITY ASSURANCE

- A. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.
- B. Accept conduit on site. Inspect for damage.
- C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.
- C. Underground:
 - 1. Under Slab on Grade: Use rigid PVC conduit.
 - 2. Exterior, Direct-Buried: Use rigid PVC conduit.
 - 3. Exterior, Embedded Within Concrete: Use rigid PVC conduit.
 - 4. Where rigid polyvinyl chloride (PVC) conduit is provided, transition to galvanized steel rigid metal conduit (RMC) or PVC-coated galvanized steel rigid metal conduit (RMC) where emerging from underground.
- D. Embedded Within Concrete:

1. Within Slab on Grade: Use rigid PVC conduit. Embed within structural slabs only where approved by Structural Engineer.
 2. Within Slab Above Ground: Use rigid PVC conduit. Embed within structural slabs only where approved by Structural Engineer.
 3. Within Concrete Walls Above Ground: Use rigid PVC conduit.
 4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit (RMC) or PVC-coated galvanized steel rigid metal conduit (RMC) where emerging from concrete.
- E. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit (RMC).
- F. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit (RMC).
- G. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
- H. Exposed, Exterior: Use galvanized steel rigid metal conduit.
- I. Corrosive Locations Above Ground: Use PVC-coated galvanized steel rigid metal conduit.
- J. Hazardous (Classified) Locations: Use galvanized steel rigid metal conduit or PVC-coated galvanized steel rigid metal conduit.
- K. Flexible Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit (FMC).
1. Maximum Length: 6 feet.
- L. Flexible Connections to Vibrating Equipment:
1. Dry Locations: Use flexible metal conduit (FMC).
 2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit (LFMC).
 3. Maximum Length: 6 feet unless otherwise indicated.
 4. Vibrating equipment includes, but is not limited to:
 - a. Transformers.
 - b. Motors.

2.02 CONDUIT - GENERAL REQUIREMENTS

- A. Comply with NFPA 70.
- B. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- C. Provide products listed, classified, and labeled as suitable for purpose intended.
- D. Minimum Conduit Size, Unless Otherwise Indicated:
1. Branch Circuits: 3/4-inch trade size.
 2. Underground, Exterior: 1-inch trade size.
- E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Manufacturers:
1. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.com/#sle.
 2. Wheatland Tube, a division of Zekelman Industries: www.wheatland.com/#sle.
 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- C. Fittings:
1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
 2. Hazardous/Classified Locations: Use fittings listed and labeled as complying with UL 1203 for classification of installed location.
 3. Material: Use steel or malleable iron.

4. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.04 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Manufacturers:
 1. Allied Tube & Conduit : www.alliedeg.com.
 2. Atkore; Calbond: www.calbond.com.
 3. Engineer approved equivalent.
- B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6 and ETL PVC-001.
- C. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil, 0.040 inch.
- D. Interior Coating: Urethane, minimum thickness of 2 mil, 0.002 inch.
- E. PVC-Coated Boxes and Fittings:
 1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
 2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B. Conduit bodies shall also comply with UL Type 4X and IEC IP69.
 3. Hazardous/Classified Locations: Use fittings listed and labeled as complying with UL 1203 for classification of installed location.
 4. Material: Use steel or malleable iron.
 5. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil, 0.040 inch.
 6. Interior Coating: Urethane, minimum thickness of 2 mil, 0.002 inch.
- F. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil, 0.015 inch.
- G. Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.
- H. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.05 FLEXIBLE METAL CONDUIT (FMC)

- A. Manufacturers:
 1. Anamet Inc.
 2. Electri-Flex Company: www.electriflex.com/#sle.
 3. Engineer approved equivalent.
- B. Description: NFPA 70, Type FMC standard-wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems.
- C. Fittings:
 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 2. Material: Use steel or malleable iron.
- D. Description: Interlocked aluminum construction.
- E. Fittings: NEMA FB 1.

2.06 LIQUIDTIGHT FLEXIBLE METALLIC AND NONMETALLIC CONDUIT

- A. Manufacturers:
 1. AFC Cable Systems, a division of Atkore International: www.afcweb.com/#sle.
 2. Electri-Flex Company: www.electriflex.com/#sle.
 3. International Metal Hose: www.metalhose.com/#sle.
 4. Engineer approved equivalent.
- B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

- C. Fittings:
 - 1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
 - 2. Material: Use steel or malleable iron.
- D. Description: Interlocked aluminum construction with PVC jacket.
- E. Fittings: NEMA FB 1.

2.07 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

- A. Manufacturers:
 - 1. Allied Tube & Conduit, a division of Atkore International: www.alliedeg.com/#sle.
 - 2. Cantex: <https://www.cantexinc.com/>.
 - 3. Electri-Flex Company: www.electriflex.com.
 - 4. Endot Ind.
 - 5. Engineer approved equivalent.
- B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
- C. Fittings:
 - 1. Manufacturer: Same as manufacturer of conduit to be connected.
 - 2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.
- D. Rigid Plastic Conduit:
 - 1. Description: NEMA TC 2; Schedule 80 PVC.
 - 2. Fittings and Conduit Bodies: NEMA TC 3.

2.08 ACCESSORIES

- A. Conduit Joint Compound: Corrosion-resistant, electrically conductive compound listed as complying with UL 2419; suitable for use with conduit to be installed.
- B. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
- C. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf.
- D. Foam Conduit Sealant:
 - 1. Removable, two-part, closed-cell foam, specifically designed for sealing conduit openings against water, moisture, gases, and dust.
 - 2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
 - 3. Rated to hold minimum of 10 ft water head pressure.
- E. Conduit Mechanical Seals:
 - 1. Listed as complying with UL 514B.
 - 2. Specifically designed for sealing conduit openings against water, moisture, gases, and dust.
 - 3. Suitable for sealing around conductors/cables to be installed.
- F. Sealing Compound for Hazardous/Classified Location Sealing Fittings: Listed for use with particular fittings to be installed.
- G. Sealing Systems for Concrete Penetrations:
 - 1. Sleeves: Provide water stop ring or cement coating that bonds to concrete to prevent water infiltration.
 - 2. Rate for minimum of 40 psig; suitable for sealing around conduits to be installed.
- H. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.

- I. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.
- J. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.
- K. Duct Bank Spacers: Nonmetallic; designed for maintaining conduit/duct spacing for concrete encasement in open trench installation; suitable for conduit/duct arrangement to be installed.
- L. Bore Spacers: Nonmetallic; designed for maintaining conduit/duct spacing for installation within casing; furnished with roller wheels to facilitate installation, openings to facilitate grout flow, and holes for stabilization cable; suitable for casing and conduit/duct arrangement to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surface is ready for conduit installation.
- B. Examine conduit to verify that it is free from damage.
- C. Examine conduit to verify it is free of foreign objects.
- D. Verify that field measurements are as indicated.
- E. Verify that mounting surfaces are ready to receive conduits.
- F. Verify that conditions are satisfactory for installation prior to starting work.
- G. Verify routing and termination locations of conduit prior to rough-in.
- H. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install conduit in accordance with NECA 1.
- C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.
- D. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer. Those installing PVC-coated galvanized steel rigid metal conduit shall be certified by the manufacturer and be able to provide a valid, unexpired Installer Certification card prior to installation beginning.
- E. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.
- F. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conduits in the following areas may be exposed, unless otherwise indicated:
 - a. Electrical rooms.
 - b. Mechanical equipment rooms.
 - c. Within joists in areas with no ceiling.
 - 4. Unless otherwise approved, do not route exposed conduits:
 - a. Across floors.
 - b. Across roofs.
 - c. Across top of parapet walls.
 - d. Across building exterior surfaces.
 - 5. Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
 - 6. Arrange conduit to maintain adequate headroom, clearances, and access.

7. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.
 8. Arrange conduit to provide no more than 150 feet between pull points.
 9. Route conduits above water and drain piping where possible.
 10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
 11. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
 12. Maintain minimum clearance of 12 inches between conduits and hot surfaces.
 13. Group parallel conduits in same area on common rack.
- G. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 26 0529.
 2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
 4. Use conduit strap to support single surface-mounted conduit.
 - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
 5. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
 6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
 7. Use trapeze hangers assembled from threaded rods and metal channel/strut with accessory conduit clamps to support multiple parallel suspended conduits.
 8. Use nonpenetrating rooftop supports to support conduits routed across rooftops, where approved.
 9. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with most stringent requirements.
- H. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
 2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
 3. Use suitable adapters where required to transition from one type of conduit to another.
 4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
 5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
 6. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
 7. Secure joints and connections to provide mechanical strength and electrical continuity.
- I. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 4. Conceal bends for conduit risers emerging above ground.
 5. Provide suitable sealing system where conduits penetrate exterior wall below grade.
 6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.

7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.
8. Install firestopping to preserve fire resistance rating of partitions and other elements.
- J. Underground Installation:
 1. Provide trenching and backfilling; see Section 31 2316.13.
 2. Provide trenching and backfilling; see Section 31 2316 and Section 31 2323.
 3. Minimum Cover, Unless Otherwise Indicated or Required:
 - a. Underground, Exterior: 24 inches.
 - b. Under Slab on Grade: 12 inches to bottom of slab.
 4. Provide underground warning tape along entire conduit length for service entrance where not concrete-encased; see Section 26 0553.
- K. Embedment Within Structural Concrete Slabs (only where approved by Structural Engineer):
 1. Secure conduits to prevent floating or movement during pouring of concrete.
- L. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide minimum concrete cover of 3 inches on all sides unless otherwise indicated; see Section 03 3000.
- M. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
 1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
 3. Where conduits are subject to earth movement by settlement or frost.
- N. Conduit Sealing:
 1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
 - a. Where conduits enter building from outside.
 - b. Where service conduits enter building from underground distribution system.
 - c. Where conduits enter building from underground.
 - d. Where conduits may transport moisture to contact live parts.
 2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
 - a. Where conduits pass from outdoors into conditioned interior spaces.
 - b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
 3. Where conduits cross boundaries of hazardous/classified locations, provide identified/listed sealing fittings or conduit mechanical seals as approved by authorities having jurisdiction; locate as indicated or in accordance with NFPA 70.
- O. Provide pull string in each empty conduit and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.
- P. Provide grounding and bonding; see Section 26 0526.
- Q. Identify conduits; see Section 26 0553.

3.03 FIELD QUALITY CONTROL

- A. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- B. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions with a manufacturer approved touch-up compound or repair kit.

- C. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING

- A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION 26 0533.13

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SECTION 26 0533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.
- C. Boxes for hazardous (classified) locations.
- D. Underground boxes/enclosures.
- E. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete.
- B. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- C. Section 26 0529 - Hangers and Supports for Electrical Systems.
- D. Section 26 0533.13 - Conduit for Electrical Systems:
 - 1. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 2726 - Wiring Devices:
 - 1. Additional requirements for locating boxes for wiring devices.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
- E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- F. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- G. NFPA 70 - National Electrical Code.
- H. SCTE 77 - Specifications for Underground Enclosure Integrity.
- I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations.
- J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations.
- K. UL 508A - Industrial Control Panels.
- L. UL 514A - Metallic Outlet Boxes.
- M. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.

4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 1. See Section 01 6000 - Product Requirements, for additional provisions.
 2. Keys for Lockable Enclosures: Two of each different key.

1.06 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years documented experience.
- B. Comply with requirements of NFPA 70.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- D. Products: Provide products listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 BOXES

- A. General Requirements:
 1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
 3. Provide products listed, classified, and labeled as suitable for the purpose intended.
 4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
 1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 2. Use cast iron boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 3. Use suitable concrete type boxes where flush-mounted in concrete.
 4. Use suitable masonry type boxes where flush-mounted in masonry walls.

5. Use raised covers suitable for the type of wall construction and device configuration where required.
 6. Use shallow boxes where required by the type of wall construction.
 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 12. Minimum Box Size, Unless Otherwise Indicated:
 - a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
 13. Wall Plates: Comply with Section 26 2726.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
 - a. Indoor Clean, Dry Locations: Type 12, painted steel.
 - b. Outdoor Locations: Type 4X, stainless steel.
 3. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
 - b. Boxes 6 square feet and Larger: Provide sectionalized screw-cover or hinged-cover enclosures.
 4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
 - a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
 - b. Back Panels: Painted steel, removable.
 5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
- D. Boxes for Hazardous (Classified) Locations: Listed and labeled as complying with UL 1203 for the classification of the installed location.
- E. Underground Boxes/Enclosures:
1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
 2. Size: As indicated on drawings.
 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.
 4. Provide logo on cover to indicate type of service.
 5. Applications:
 - a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 8 load rating.
 - b. Parking Lots, in Areas Subject Only To Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 22 load rating.
 - c. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
 6. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
 - a. Manufacturers:
 - 1) Hubbell Incorporated; Quazite Products: www.hubbellpowersystems.com/#sle.
 - 2) MacLean Highline: www.macleanhigline.com/#sle.
 - 3) Oldcastle Precast, Inc: www.oldcastleprecast.com/#sle.
 - 4) Substitutions: See Section 01 6000 - Product Requirements.

- b. Combination fiberglass/polymer concrete boxes/enclosures are not acceptable. Use all-polymer concrete boxes/enclosures.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.
- D. Examine prints for locations of all outlets.
- E. Verify rooms and walls are ready to accept boxes.
- F. Verify field measurements are as shown on Drawings.
- G. Verify locations of floor boxes and outlets in offices and work areas prior to rough-in.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- E. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
- F. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- G. Box Locations:
 - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 3100 as required where approved by the Architect.
 - 2. Unless dimensioned, box locations indicated are approximate.
 - 3. Locate boxes as required for devices installed under other sections or by others.
 - a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 2726.
 - 4. Locate boxes so that wall plates do not span different building finishes.
 - 5. Locate boxes so that wall plates do not cross masonry joints.
 - 6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
 - 7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
 - 8. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
 - a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
 - 9. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 0533.13.
 - 10. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
 - a. Concealed above accessible suspended ceilings.
 - b. Within joists in areas with no ceiling.
 - c. Electrical rooms.
 - d. Mechanical equipment rooms.

- H. Box Supports:
 - 1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
 - 3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
 - 4. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.
- I. Install boxes plumb and level.
- J. Flush-Mounted Boxes:
 - 1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
 - 2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
 - 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.
- K. Floor-Mounted Cabinets: Mount on properly sized 3 inch high concrete pad constructed in accordance with Section 03 3000.
- L. Install boxes as required to preserve insulation integrity.
- M. Underground Boxes/Enclosures:
 - 1. Install enclosure on gravel base, minimum 6 inches deep.
 - 2. Flush-mount enclosures located in concrete or paved areas.
 - 3. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.
 - 4. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.
- N. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- O. Install firestopping to preserve fire resistance rating of partitions and other elements.
- P. Close unused box openings.
- Q. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- R. Provide grounding and bonding in accordance with Section 26 0526.
- S. Identify boxes in accordance with Section 26 0553.
- T. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70.
- U. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.
 - 1. Adjust box locations up to 10 feet if required to accommodate intended purpose.
- V. Maintain headroom and present neat mechanical appearance.
- W. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- X. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
- Y. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

- Z. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation. Provide minimum 24 inches separation in acoustic rated walls.
- AA. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- BB. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- CC. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- DD. Use adjustable steel channel fasteners for hung ceiling outlet box.
- EE. Do not fasten boxes to ceiling support wires.
- FF. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
- GG. Use gang box where more than one device is mounted together. Do not use sectional box.
- HH. Use gang box with plaster ring for single device outlets.
- II. Use cast outlet box in exterior locations exposed to the weather, unfinished areas and wet locations.
- JJ. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.
 - 1. Provide pull boxes where indicated on drawings or required to facilitate the installation of the conduit and wire.
 - 2. Pull box construction, in general, shall be NEMA 1 unless noted otherwise on the drawings.
 - 3. Pull boxes shall be located in unfinished areas unless specifically permitted on the drawings.

3.03 ADJUSTING

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused box openings.

3.04 CLEANING

- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.05 PROTECTION

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

3.06 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate installation of outlet box.
- B. Coordinate locations and sizes of required access doors.
- C. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- D. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
- E. Position outlet boxes to locate luminaires as shown on reflected ceiling plan.

END OF SECTION 26 0533.16

**SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Wire and cable markers.
- D. Warning signs and labels.

1.02 RELATED REQUIREMENTS

- A. Section 26 0519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
- B. Section 26 0573 - Power System Studies: Arc flash hazard warning labels.

1.03 REFERENCE STANDARDS

- A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs.
- B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels.
- C. NFPA 70 - National Electrical Code.
- D. NFPA 70E - Standard for Electrical Safety in the Workplace.
- E. UL 969 - Marking and Labeling Systems.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
 - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
 - 2. Do not install identification products until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
- C. Product Data: Provide catalog data for nameplates, labels, and markers.
- D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

- A. Identification for Equipment:
 - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
 - a. Motor Control Centers:
 - 1) Identify power source and circuit number. Include location when not within sight of equipment.
 - 2) Use identification nameplate to identify main overcurrent protective device.

- 3) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
 - b. Panelboards:
 - 1) Identify power source and circuit number. Include location when not within sight of equipment.
 - 2) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
 - 3) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
 - c. Transformers:
 - 1) Identify power source and circuit number. Include location when not within sight of equipment.
 - d. Enclosed switches, circuit breakers, and motor controllers:
 - 1) Identify load(s) served. Include location when not within sight of equipment.
 - e. Time Switches:
 - 1) Identify load(s) served and associated circuits controlled. Include location.
 - f. Enclosed Contactors:
 - 1) Identify load(s) and associated circuits controlled. Include location.
 2. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
 3. Use field-painted floor markings to identify required equipment working clearances where indicated or where required by the authority having jurisdiction.
 - a. Field-Painted Floor Markings: Alternating black and white stripes, 3 inches wide, painted in accordance with Section 09 9123 and 09 9113.
 4. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
 - a. Industrial control panels.
 - b. Motor control centers.
 - c. Industrial machinery.
 5. Arc Flash Hazard Warning Labels: Comply with Section 26 0573.
 6. Use warning signs to identify electrical hazards for entrances to all rooms and other guarded locations that contain exposed live parts operating at 600 V nominal or less with the word message "DANGER; Electrical hazard; Authorized personnel only" or approved equivalent.
- B. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
 2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
 3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
 - a. At each source and load connection.
 - b. Within boxes when more than one circuit is present.
 - c. Within equipment enclosures when conductors and cables enter or leave the enclosure.
 4. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.
 5. Use underground warning tape to identify direct buried cables.
- C. Identification for Raceways:
1. Use voltage markers, color-coded bands, or factory-painted conduits to identify systems other than normal power system for accessible conduits.
 - a. Maximum Intervals: 20 feet.

- b. Color-Coded Bands: Use field-painting or vinyl color coding electrical tape to mark bands 3 inches wide.
 - 1) Field-Painting: Comply with Section 09 9123 and 09 9113.
 - 2) Vinyl Color Coding Electrical Tape: Comply with Section 26 0519.
 - c. Color Code:
 - 2. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify circuits enclosed for accessible conduits at wall penetrations, at floor penetrations, at roof penetrations, and at equipment terminations when source is not within sight.
 - 3. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify spare conduits at each end. Identify purpose and termination location.
 - 4. Use underground warning tape to identify underground raceways.
- D. Identification for Boxes:
 - 1. Use color coded boxes to identify specified systems.
 - a. Color-Coded Boxes: Field-painted in accordance with Section 09 9123 and 09 9113 per the same color code used for raceways.
 - b. For exposed boxes in public areas, do not color code.
- E. Identification for Devices:
 - 1. Wiring Device and Wallplate Finishes: Comply with Section 26 2726.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Nameplates:
 - 1. Manufacturers:
 - a. Brimar Industries, Inc: www.brimar.com/#sle.
 - b. Kolbi Pipe Marker Co: www.kolbipipemarkers.com/#sle.
 - c. Seton Identification Products: www.seton.com/#sle.
 - 2. Materials:
 - a. Indoor Clean, Dry Locations: Use plastic nameplates.
 - b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
 - 3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
 - 4. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
 - 5. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
 - 6. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.
- B. Identification Labels:
 - 1. Manufacturers:
 - a. Brady Corporation: www.bradyid.com/#sle.
 - b. Brother International Corporation: www.brother-usa.com/#sle.
 - c. Panduit Corp: www.panduit.com/#sle.
 - 2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
 - a. Use only for indoor locations.
 - 3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
- C. Format for Equipment Identification:
 - 1. Minimum Size: 1 inch by 2.5 inches.
 - 2. Legend:
 - a. System designation where applicable:
 - b. Equipment designation or other approved description.
 - 3. Text: All capitalized unless otherwise indicated.

4. Minimum Text Height:
 - a. System Designation: 1 inch.
 - b. Equipment Designation: 1/2 inch.
 - c. Other Information: 1/4 inch.
 - d. Exception: Provide minimum text height of 1 inch for equipment located more than 10 feet above floor or working platform.
5. Color:
 - a. Normal Power System: White text on black background.
- D. Format for General Information and Operating Instructions:
 1. Minimum Size: 1 inch by 2.5 inches.
 2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
 3. Text: All capitalized unless otherwise indicated.
 4. Minimum Text Height: 1/4 inch.
 5. Color: Black text on white background unless otherwise indicated.
- E. Format for Caution and Warning Messages:
 1. Minimum Size: 2 inches by 4 inches.
 2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
 3. Text: All capitalized unless otherwise indicated.
 4. Minimum Text Height: 1/2 inch.
 5. Color: Black text on yellow background unless otherwise indicated.
- F. Format for Receptacle Identification:
 1. Minimum Size: 3/8 inch by 1.5 inches.
 2. Legend: Power source and circuit number or other designation indicated.
 3. Text: All capitalized unless otherwise indicated.
 4. Minimum Text Height: 3/16 inch.
 5. Color: Black text on clear background.
- G. Format for Control Device Identification:
 1. Minimum Size: 3/8 inch by 1.5 inches.
 2. Legend: Load controlled or other designation indicated.
 3. Text: All capitalized unless otherwise indicated.
 4. Minimum Text Height: 3/16 inch.
 5. Color: Black text on clear background.

2.03 WIRE AND CABLE MARKERS

- A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.
- B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
- C. Legend: Power source and circuit number or other designation indicated.
- D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
- E. Minimum Text Height: 1/8 inch.
- F. Color: Black text on white background unless otherwise indicated.
- G. Description: split sleeve type wire markers.
- H. Locations: Each conductor at motor control centers, control panels, panelboard gutters, pull boxes, and junction boxes at each load connection.
- I. Legend:
 1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.

2. Control Circuits: Control wire number indicated on shop drawings.

2.04 WARNING SIGNS AND LABELS

- A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- B. Warning Signs:
 1. Materials:
 - a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
 - b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
 2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
 3. Minimum Size: 7 by 10 inches unless otherwise indicated.
- C. Warning Labels:
 1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
 2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
 3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.
- B. Degrease and clean surfaces to receive nameplates and labels.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
 1. Surface-Mounted Equipment: Enclosure front.
 2. Flush-Mounted Equipment: Inside of equipment door.
 3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
 4. Elevated Equipment: Legible from the floor or working platform.
 5. Branch Devices: Adjacent to device.
 6. Interior Components: Legible from the point of access.
 7. Conduits: Legible from the floor.
 8. Boxes: Outside face of cover.
 9. Conductors and Cables: Legible from the point of access.
 10. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- F. Secure rigid signs using stainless steel screws.
- G. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

- C. Install nameplates and labels parallel to equipment lines.

END OF SECTION 26 0553

**SECTION 26 0573
POWER SYSTEM STUDIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Short-circuit study.
- B. Protective device coordination study.
- C. Arc flash and shock risk assessment.
 - 1. Includes arc flash hazard warning labels.
- D. Criteria for the selection and adjustment of equipment and associated protective devices not specified in this section, as determined by studies to be performed.

1.02 RELATED REQUIREMENTS

- A. Section 26 0553 - Identification for Electrical Systems: Additional requirements for arc flash hazard warning labels.
- B. Section 26 2416 - Panelboards.
- C. Section 26 2419 - Motor-Control Centers.
- D. Section 26 2813 - Fuses.
- E. Section 26 2816.16 - Enclosed Switches.

1.03 REFERENCE STANDARDS

- A. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels.
- B. IEEE 141 - IEEE Recommended Practice for Electric Power Distribution for Industrial Plants.
- C. IEEE 242 - IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.
- D. IEEE 399 - IEEE Recommended Practice for Industrial and Commercial Power Systems Analysis.
- E. IEEE 551 - IEEE Recommended Practice for Calculating Short-Circuit Currents in Industrial and Commercial Power Systems.
- F. IEEE 1584 - IEEE Guide for Performing Arc-Flash Hazard Calculations.
- G. NEMA MG 1 - Motors and Generators.
- H. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- I. NFPA 70 - National Electrical Code.
- J. NFPA 70E - Standard for Electrical Safety in the Workplace.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Existing Installations: Coordinate with equipment manufacturer(s) to obtain data necessary for completion of studies.
 - 2. Coordinate the work to provide equipment and associated protective devices complying with criteria for selection and adjustment, as determined by studies to be performed.
 - 3. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Submit study reports prior to or concurrent with product submittals.
 - 2. Do not order equipment until matching study reports and product submittals have both been evaluated by Engineer.
- C. Scheduling:

1. Arrange access to existing facility for data collection with Owner.
2. Where work of this section involves interruption of existing electrical service, arrange service interruption with Owner.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Study preparer's qualifications.
- C. Field testing agency's qualifications.
- D. Study reports, stamped or sealed and signed by study preparer.
- E. Field quality control reports.
- F. Certification that field adjustable protective devices have been set in accordance with requirements of studies.
- G. Project Record Documents: Revise studies as required to reflect as-built conditions.
 1. Include hard copies with operation and maintenance data submittals.
 2. Include computer software files used to prepare studies with file name(s) cross-referenced to specific pieces of equipment and systems.

1.06 POWER SYSTEM STUDIES

- A. Scope of Studies:
 1. Perform analysis of both new and directly affected existing portions of electrical distribution system as indicated on drawings.
 2. Except where study descriptions below indicate exclusions, analyze system at each bus from primary protective devices of utility source down to each piece of equipment involved, including parts of system affecting calculations being performed (e.g. fault current contribution from motors).
- B. General Study Requirements:
 1. Comply with NFPA 70.
 2. Perform studies utilizing computer software complying with specified requirements; manual calculations are not permitted.
- C. Data Collection:
 1. Compile information on project-specific characteristics of actual installed equipment, protective devices, feeders, etc. as necessary to develop single-line diagram of electrical distribution system and associated input data for use in system modeling.
 - a. Motors: Include manufacturer/model, type (e.g. induction, synchronous), horsepower rating, voltage rating, full load amps, and locked rotor current or NEMA MG 1 code letter designation.
 - b. Transformers: Include primary and secondary voltage ratings, kVA rating, winding configuration, percent impedance, and X/R ratio.
 - c. Protective Devices:
 - 1) Circuit Breakers: Include manufacturer/model, type (e.g. thermal magnetic, electronic trip), frame size, trip rating, voltage rating, interrupting rating, available field-adjustable trip response settings, and features (e.g. zone selective interlocking).
 - 2) Fuses: Include manufacturer/model, type/class (e.g. Class J), size/rating, and speed (e.g. time delay, fast acting).
 - d. Protective Relays: Include manufacturer/model, type, settings, current/potential transformer ratio, and associated protective device.
 - e. Conductors: Include feeder size, material (e.g. copper, aluminum), insulation type, voltage rating, number per phase, raceway type, and actual length.
 2. Existing Installations:
 - a. Provide the services of field testing agency or equipment manufacturer's representative to perform field data collection.

- b. Collect data on existing electrical distribution system necessary for completion of studies, including field verification of available existing data (e.g. construction documents, previous studies). Include actual settings for field-adjustable devices.
- D. Short-Circuit Study:
 - 1. Comply with IEEE 551 and applicable portions of IEEE 141, IEEE 242, and IEEE 399.
 - 2. For purposes of determining equipment short circuit current ratings, consider conditions that may result in maximum available fault current, including but not limited to:
 - a. Maximum utility fault currents.
 - b. Maximum motor contribution.
 - c. Known operating modes (e.g. utility as source, generator as source, utility/generator in parallel, bus tie breaker open/close positions).
 - 3. For each bus location, calculate the maximum available three-phase bolted symmetrical and asymmetrical fault currents. For grounded systems, also calculate the maximum available line-to-ground bolted fault currents.
- E. Protective Device Coordination Study:
 - 1. Comply with applicable portions of IEEE 242 and IEEE 399.
 - 2. Analyze alternate scenarios considering known operating modes (e.g. utility as source, generator as source, utility/generator in parallel, bus tie breaker open/close positions).
 - 3. Analyze protective devices and associated settings for suitable margins between time-current curves to provide adequate protection for equipment and conductors while achieving full selective coordination.
- F. Arc Flash and Shock Risk Assessment:
 - 1. Comply with NFPA 70E.
 - 2. Perform incident energy and arc flash boundary calculations in accordance with IEEE 1584 (as referenced in NFPA 70E Annex D), where applicable.
 - a. Where reasonable, study preparer may assume a maximum clearing time of two seconds in accordance with IEEE 1584, provided that the conditions are such that a worker's egress from an arc flash event would not be inhibited.
 - b. For single-phase systems, study preparer to perform calculations assuming three-phase system in accordance with IEEE 1584 using single phase bolted fault current, yielding conservative results.
 - 3. For equipment with main devices mounted in separate compartmentalized sections, perform calculations on both the line and load side of the main device.
 - 4. Analyze alternate scenarios considering conditions that may result in maximum incident energy, including but not limited to:
 - a. Maximum and minimum utility fault currents.
 - b. Maximum and minimum motor contribution.
 - c. Known operating modes (e.g. utility as source, generator as source, utility/generator in parallel, bus tie breaker open/close positions).
- G. Study Reports:
 - 1. General Requirements:
 - a. Identify date of study and study preparer.
 - b. Identify study methodology and software product(s) used.
 - c. Identify scope of studies, assumptions made, implications of possible alternate scenarios, and any exclusions from studies.
 - d. Identify base used for per unit values.
 - e. Include single-line diagram and associated input data used for studies; identify buses on single-line diagram as referenced in reports, and indicate bus voltage.
 - f. Include conclusions and recommendations.
 - 2. Short-Circuit Study:
 - a. For each scenario, identify at each bus location:

- 1) Calculated maximum available symmetrical and asymmetrical fault currents (both three-phase and line-to-ground where applicable).
 - 2) Fault point X/R ratio.
 - 3) Associated equipment short circuit current ratings.
 - b. Identify locations where the available fault current exceeds the equipment short circuit current rating, along with recommendations.
3. Protective Device Coordination Study:
 - a. For each scenario, include time-current coordination curves plotted on log-log scale graphs.
 - b. For each graph include (where applicable):
 - 1) Partial single-line diagram identifying the portion of the system illustrated.
 - 2) Protective Devices: Time-current curves with applicable tolerance bands for each protective device in series back to the source, plotted up to the maximum available fault current at the associated bus.
 - 3) Conductors: Damage curves.
 - 4) Transformers: Inrush points and damage curves.
 - 5) Generators: Full load current, overload curves, decrement curves, and short circuit withstand points.
 - 6) Motors: Full load current, starting curves, and damage curves.
 - 7) Capacitors: Full load current and damage curves.
 - c. For each protective device, identify fixed and adjustable characteristics with available ranges and recommended settings.
 - 1) Circuit Breakers: Include long time pickup and delay, short time pickup and delay, and instantaneous pickup.
 - 2) Include ground fault pickup and delay.
 - 3) Include fuse ratings.
 - 4) Protective Relays: Include current/potential transformer ratios, tap, time dial, and instantaneous pickup.
 - d. Identify cases where either full selective coordination or adequate protection is not achieved, along with recommendations.
4. Arc Flash and Shock Risk Assessment:
 - a. For the worst case for each scenario, identify at each bus location:
 - 1) Calculated incident energy and associated working distance.
 - 2) Calculated arc flash boundary.
 - 3) Bolted fault current.
 - 4) Arcing fault current.
 - 5) Clearing time.
 - 6) Arc gap distance.
 - b. For purposes of producing arc flash hazard warning labels, summarize the maximum incident energy and associated data reflecting the worst case condition of all scenarios at each bus location.
 - c. Include recommendations for reducing the incident energy at locations where the calculated maximum incident energy exceeds 8 calories per sq cm.

1.07 QUALITY ASSURANCE

- A. Study Preparer Qualifications: Professional electrical engineer licensed in Iowa and with minimum five years experience in preparation of studies of similar type and complexity using specified computer software.
 1. Study preparer may be employed by manufacturer of electrical distribution equipment.
 2. Study preparer may be employed by field testing agency.
- B. Field Testing Agency Qualifications: Independent testing organization specializing in testing, analysis, and maintenance of electrical systems with minimum five years experience; NETA Accredited Company.

- C. Computer Software for Study Preparation: Use the latest edition of commercially available software utilizing specified methodologies.
1. Products:
 - a. EasyPower LLC: www.easypower.com/#sle.
 - b. ETAP/Operation Technology, Inc: www.etap.com/#sle.
 - c. Power Analytics Corporation: www.poweranalytics.com/#sle.
 - d. SKM Systems Analysis, Inc: www.skm.com/#sle.

PART 2 PRODUCTS

2.01 ARC FLASH HAZARD WARNING LABELS

- A. Provide warning labels complying with ANSI Z535.4 to identify arc flash hazards for each work location analyzed by the arc flash and shock risk assessment.
1. Materials: Comply with Section 26 0553.
 2. Minimum Size: 4 by 6 inches.
 3. Legend: Provide custom legend in accordance with NFPA 70E based on equipment-specific data as determined by arc flash and shock risk assessment.
 - a. Include orange header that reads "WARNING" where calculated incident energy is less than 40 calories per square cm unless otherwise indicated.
 - b. Include red header that reads "DANGER" where calculated incident energy is 40 calories per square cm or greater unless otherwise indicated.
 - c. Include the text "Arc Flash and Shock Hazard; Appropriate PPE Required" or approved equivalent.
 - d. Include the following information:
 - 1) Arc flash boundary.
 - 2) Available incident energy and corresponding working distance.
 - 3) Nominal system voltage.
 - 4) Limited approach boundary.
 - 5) Restricted approach boundary.
 - 6) Equipment identification.
 - 7) Study preparer, report reference, and date calculations were performed.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install arc flash warning labels in accordance with Section 26 0553.

3.02 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Provide the services of field testing agency or equipment manufacturer's representative to perform inspection, testing, and adjusting.
- C. Inspect and test in accordance with NETA ATS, except Section 4.
- D. Adjust equipment and protective devices for compliance with studies and recommended settings.
- E. Notify Engineer of any conflicts with or deviations from studies. Obtain direction before proceeding.
- F. Submit detailed reports indicating inspection and testing results, and final adjusted settings.

3.03 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

END OF SECTION 26 0573

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**SECTION 26 2200
LOW-VOLTAGE TRANSFORMERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. New two-winding transformers.
- B. Integrated power centers.

1.02 REFERENCE STANDARDS

- A. 10 CFR 431, Subpart K - Energy Efficiency Program for Certain Commercial and Industrial Equipment - Distribution Transformers.
- B. IEEE C57.94 - IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type Distribution and Power Transformers.
- C. IEEE C57.96 - IEEE Standard Guide for Loading Dry-Type Distribution and Power Transformers.
- D. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- E. NECA 409 - Standard for Installing and Maintaining Dry-Type Transformers.
- F. NEMA ST 1 - Specialty Transformers (Except General Purpose Type); National Electrical Manufacturers Association; 1988 (R1997).
- G. NEMA ST 20 - Dry Type Transformers for General Applications.
- H. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- I. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- J. NFPA 70 - National Electrical Code.
- K. UL 506 - Standard for Specialty Transformers.
- L. UL 1561 - Standard for Dry-Type General Purpose and Power Transformers.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Coordinate the work with placement of supports, anchors, etc. required for mounting.
 - 4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
 - 5. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.04 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Include voltage, kVA, impedance, tap configurations, insulation system class and rated temperature rise, efficiency, sound level, enclosure ratings, outline and support point dimensions, weight, required clearances, service condition requirements, and installed features.
 - 1. Small Power Centers: Include panelboard bus ampacity, integrated short circuit ampere rating, and circuit breaker sizes and ampere ratings.
- C. Shop Drawings: Provide dimensioned plan and elevation views of transformers and adjacent equipment with all required clearances indicated.
 - 1. Small Power Centers: Include panel arrangements.
- D. Project Record Documents: Record actual locations of transformers.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

1.07 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

1.08 MAINTENANCE

- A. Furnish maintenance materials under provisions of Section 01 7800.
- B. Furnish two each of any special tools required to operate and maintain transformer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. ABB: www.electrification.us.abb.com/#sle.
- B. Eaton Corporation: www.eaton.com/#sle.
- C. Schneider Electric: www.se.com/#sle.
- D. Engineer approved equivalent.
- E. Source Limitations: Provide transformers produced by same manufacturer as other electrical distribution equipment used for project and obtained from single supplier.

2.02 TRANSFORMERS - GENERAL REQUIREMENTS

- A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured in accordance with NEMA ST 20 and listed, classified, and labeled as suitable for the purpose intended.
- B. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE C57.96 under the following service conditions:
 - 1. Altitude: Less than 3,300 feet.
 - 2. Ambient Temperature:
 - a. Greater than 10 kVA: Not exceeding 104 degrees F.
 - b. Less than 10 kVA: Not exceeding 77 degrees F.
 - 3. Ambient Temperature: Not exceeding 86 degrees F average or 104 degrees F maximum measured during any 24 hour period.
- C. Core: High grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Keep magnetic flux densities substantially below saturation point, even at 10 percent primary overvoltage. Tightly clamp core laminations to prevent plate movement and maintain consistent pressure throughout core length.
- D. Impregnate core and coil assembly with non-hydroscopic thermo-setting varnish to effectively seal out moisture and other contaminants.
- E. Basic Impulse Level: 10 kV.

- F. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
- G. Isolate core and coil from enclosure using vibration-absorbing mounts.
- H. Nameplate: Include transformer connection data, ratings, wiring diagrams, and overload capacity based on rated winding temperature rise.

2.03 GENERAL PURPOSE TRANSFORMERS

- A. Description: Self-cooled, two winding transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated on the drawings.
- B. Insulation System and Allowable Average Winding Temperature Rise:
 - 1. Less than 15 kVA: Class 180 degrees C insulation system with 115 degrees C average winding temperature rise.
 - 2. 15 kVA and Larger: Class 220 degrees C insulation system with 150 degrees C average winding temperature rise.
- C. Coil Conductors: Continuous aluminum windings with terminations brazed or welded.
- D. Winding Taps:
 - 1. Less than 3 kVA: None.
 - 2. 3 kVA through 15 kVA: Two 5 percent full capacity primary taps below rated voltage.
 - 3. 15 kVA through 300 kVA: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.
- E. Energy Efficiency: Comply with 10 CFR 431, Subpart K.
- F. Energy Efficiency: Standard efficiency complying with NEMA TP 1.
- G. Sound Levels: Standard sound levels complying with NEMA ST 20
- H. Mounting Provisions:
 - 1. Less than 15 kVA: Suitable for wall mounting.
 - 2. 15 kVA through 75 kVA: Suitable for wall, floor, or trapeze mounting.
 - 3. Larger than 75 kVA: Suitable for floor mounting.
- I. Transformer Enclosure: Comply with NEMA ST 20.
 - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor clean, dry locations: Type 2.
 - 2. Construction: Steel.
 - a. Less than 15 kVA: Totally enclosed, non-ventilated.
 - b. 15 kVA and Larger: Ventilated.
 - 3. Finish: Manufacturer's standard grey, suitable for outdoor installations.
 - 4. Provide lifting eyes or brackets.
- J. Accessories:
 - 1. Mounting Brackets: Provide manufacturer's standard brackets.
 - 2. Lug Kits: Sized as required for termination of conductors as indicated on the drawings.
- K. Description: NEMA ST 20, factory-assembled, air cooled dry type transformers , ratings as indicated on the Drawings.
- L. K-factor rating of transformers shall be 4 unless noted otherwise on the Drawings.
- M. Primary Voltage: 480 volts, 3 phase.
- N. Secondary Voltage: 208Y/120 volts, 3 phase.
- O. Insulation system and average winding temperature rise for rated kVA as follows:
 - 1. 1-15 kVA: Class 185 with 115 degrees C rise.
 - 2. 16-500 kVA: Class 220 with 150 degrees C rise.
- P. Case Temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.

- Q. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
- R. Coil Conductors: Continuous windings with terminations brazed or welded.
- S. Isolate core and coil from enclosure using vibration-absorbing mounts.
- T. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

2.04 INTEGRATED POWER CENTERS

- A. Description: Factory assembled unit with distribution section with primary main and branch circuit breakers, transformer, and distribution section with secondary main and branch circuit breakers; ratings and panel arrangements as indicated on the drawings.
- B. Primary Voltage: 480 volts delta, 3 phase.
- C. Description: NEMA ST 20, transformer distribution unit with integral primary, secondary, and branch circuit breakers.
- D. Refer to schedule on Drawings for additional information.
- E. Secondary Voltage: 208Y/120 volts, 3 phase.
- F. Insulation System and Allowable Average Winding Temperature Rise:
 - 1. Less than 15 kVA: Class 180 degrees C insulation system with 115 degrees C average winding temperature rise.
 - 2. 15 kVA and Larger: Class 220 degrees C insulation system with 150 degrees C average winding temperature rise.
- G. Coil Conductors: Continuous windings.
- H. Winding Taps: Two 5 percent full capacity primary taps below rated voltage.
- I. Energy Efficiency: Comply with 10 CFR 431, Subpart K.
- J. Sound Levels: Standard sound levels complying with NEMA ST 20.
- K. Unit Enclosure:
 - 1. Environment Type per NEMA 250: Type 1 or Type 2.
 - 2. Construction: Steel.
 - 3. Finish: Manufacturer's standard grey, suitable for outdoor installations.
 - 4. Provide lifting eyes or brackets.
 - 5. Provide lockable hinged door for compartment housing circuit breakers.
- L. Primary Distribution Panel:
 - 1. Comply with applicable requirements of Section 26 2416.
 - 2. Bus: Copper.
 - 3. Branch Circuit Breakers: Bolt-on.
- M. Secondary Distribution Panel:
 - 1. Comply with applicable requirements of Section 26 2416.
 - 2. Bus: Copper.
 - 3. Branch Circuit Breakers: Bolt-on.
- N. Mounting: Floor.

2.05 SOURCE QUALITY CONTROL

- A. Factory test transformers according to NEMA ST 20.
- B. Production test each unit according to NEMA ST 20.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.

- B. Verify that suitable support frames and anchors are installed where required and that mounting surfaces are ready to receive transformers.
- C. Perform pre-installation tests and inspections on transformers per manufacturer's instructions and as specified in NECA 409. Correct deficiencies prior to installation.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Install transformers in accordance with NECA 409 and IEEE C57.94.
- D. Use flexible conduit, under the provisions of Section 26 0533.13, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
- E. Arrange equipment to provide minimum clearances as specified on transformer nameplate and in accordance with manufacturer's instructions and NFPA 70.
- F. Install transformers plumb and level.
- G. Transformer Support:
 - 1. Provide required support and attachment in accordance with Section 26 0529, where not furnished by transformer manufacturer.
 - 2. Use integral transformer flanges, accessory brackets furnished by manufacturer, or field-fabricated supports to support wall-mounted transformers.
 - 3. Unless otherwise indicated, mount floor-mounted transformers on properly sized 4 inch high concrete pad constructed in accordance with Section 03 3000.
- H. Install 4" concrete housekeeping pads for floor-mounted small power center where indicated on the Drawings.
- I. Set transformers plumb and level.
- J. Use flexible conduit, under the provisions of Section 26 0534, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
- K. Mount floor-mounted transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.
- L. Provide grounding and bonding in accordance with Section 26 0526.
- M. Remove shipping braces and adjust bolts that attach the core and coil mounting bracket to the enclosure according to manufacturer's recommendations in order to reduce audible noise transmission.
- N. Where not factory-installed, install lugs sized as required for termination of conductors as indicated.
- O. Identify transformers in accordance with Section 26 0553.
- P. Install transformer identification nameplate in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA STD ATS, except Section 4.

3.04 ADJUSTING

- A. Measure primary and secondary voltages and make appropriate tap adjustments.
- B. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

- A. Clean dirt and debris from transformer components according to manufacturer's instructions.

- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 26 2200

**SECTION 26 2416
PANELBOARDS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Lighting and appliance panelboards.
- B. Overcurrent protective devices for panelboards.

1.02 RELATED REQUIREMENTS

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- D. Section 26 0573 - Power System Studies: Additional criteria for the selection and adjustment of equipment and associated protective devices specified in this section.
- E. Section 26 2200 - Low-Voltage Transformers: Small power centers with integral primary breaker, transformer, and panelboard.
- F. Section 26 4300 - Surge Protective Devices.

1.03 REFERENCE STANDARDS

- A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- C. NECA 407 - Standard for Installing and Maintaining Panelboards.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts.
- F. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum).
- G. NEMA PB 1 - Panelboards.
- H. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 1000 Volts or Less.
- I. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- J. NFPA 70 - National Electrical Code.
- K. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations.
- L. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations.
- M. UL 67 - Panelboards.
- N. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
- O. UL 943 - Ground-Fault Circuit-Interrupters.
- P. UL 1053 - Ground-Fault Sensing and Relaying Equipment.
- Q. UL 1699 - Arc-Fault Circuit-Interrupters.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted panelboards where indicated.
4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
5. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
- C. Project Record Documents: Record actual installed locations of panelboards and actual installed circuiting arrangements.
- D. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 1. See Section 01 6000 - Product Requirements, for additional provisions.
 2. Panelboard Keys: Two of each different key.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Perform Work in accordance with NECA Standard of Installation.
- C. Maintain one copy of document on site.
- D. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

1.09 MAINTENANCE MATERIALS

- A. See Section 01 6000 - Product Requirements, for additional provisions.
- B. Furnish two of each panelboard key.
- C. Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. ABB: www.electrification.us.abb.com/#sle.
- B. Eaton Corporation: www.eaton.com/#sle.
- C. Schneider Electric: www.se.com/#sle.

- D. Source Limitations: Provide panelboards and associated components produced by same manufacturer as other electrical distribution equipment used for project and obtained from a single supplier.

2.02 PANELBOARDS - GENERAL REQUIREMENTS

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
1. Altitude: Less than 6,600 feet.
 2. Ambient Temperature:
 - a. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.
- C. Short Circuit Current Rating:
1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as determined by short circuit study performed in accordance with Section 26 0573.
- D. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.
- E. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.
- F. Bussing: Sized in accordance with UL 67 temperature rise requirements.
1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
 2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
- G. Conductor Terminations: Suitable for use with the conductors to be installed.
- H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: Type 1.
 2. Boxes: Galvanized steel unless otherwise indicated.
 - a. Provide wiring gutters sized to accommodate the conductors to be installed.
 3. Fronts:
 - a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
 - b. Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.
 - c. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.
 4. Lockable Doors: All locks keyed alike unless otherwise indicated.
- I. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.
- J. Surge Protective Devices: Where factory-installed, internally mounted surge protective devices are provided in accordance with Section 26 4300, list and label panelboards as a complete assembly including surge protective device.
- K. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
- L. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.
- M. Multi-Section Panelboards: Provide enclosures of the same height, with feed-through lugs or sub-feed lugs and feeders as indicated or as required to interconnect sections.
- N. Load centers are not acceptable.

2.03 LIGHTING AND APPLIANCE PANELBOARDS

- A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.
- B. Conductor Terminations:
 - 1. Main and Neutral Lug Material: Copper, suitable for terminating copper conductors only.
 - 2. Main and Neutral Lug Type: Mechanical.
- C. Bussing:
 - 1. Phase Bus Connections: Arranged for sequential phasing of overcurrent protective devices.
 - 2. Phase and Neutral Bus Material: Copper.
 - 3. Ground Bus Material: Copper.
- D. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated.
- E. Enclosures:
 - 1. Provide surface-mounted or flush-mounted enclosures as indicated.
 - 2. Fronts: Provide door-in-door trim with hinged cover for access to load terminals and wiring gutters, and separate lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
 - 3. Provide clear plastic circuit directory holder mounted on inside of door.
- F. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.
- G. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard ; provide insulated ground bus where scheduled.
- H. Minimum Fully-Rated Integrated Short Circuit Rating: As indicated. See Drawings.
- I. Molded Case Circuit Breakers: Thermal magnetic trip circuit breakers, type, with common trip handle for all poles; UL listed.
 - 1. Type SWD for lighting circuits.
 - 2. Type HACR for air conditioning equipment circuits.
 - 3. Class A ground fault interrupter circuit breakers where scheduled.
 - 4. Do not use tandem circuit breakers.
- J. Current Limiting Molded Case Circuit Breakers: With integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole; UL listed. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.
- K. Enclosure: NEMA PB 1, as scheduled.
- L. Cabinet Box: 6 inches deep, 20 inches wide for 240 volt and less panelboards, 20 inches wide for 480 volt panelboards.
- M. Provide cabinet with hinged trim.
- N. Cabinet Front: Surface cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.
- O. Refer to Drawings for additional information on panelboards.

2.04 OVERCURRENT PROTECTIVE DEVICES

- A. Molded Case Circuit Breakers:
 - 1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
 - 2. Interrupting Capacity:
 - a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:

- 1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
 - 2) 14,000 rms symmetrical amperes at 480 VAC.
- b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
3. Conductor Terminations:
 - a. Provide mechanical lugs unless otherwise indicated.
 - b. Lug Material: Copper, suitable for terminating copper conductors only.
4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
 - a. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
5. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
 - a. Provide the following field-adjustable trip response settings:
 - 1) Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
 - 2) Long time delay.
 - 3) Short time pickup and delay.
 - 4) Instantaneous pickup.
 - 5) Ground fault pickup and delay where ground fault protection is indicated.
6. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
7. Provide the following circuit breaker types where indicated:
 - a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
 - b. Ground Fault Equipment Protection Circuit Breakers: Designed to trip at 30 mA for protection of equipment.
 - c. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Combination type listed as complying with UL 1699.
 - d. 100 Percent Rated Circuit Breakers: Listed for application within the panelboard where installed at 100 percent of the continuous current rating.
8. Do not use tandem circuit breakers.
9. Do not use handle ties in lieu of multi-pole circuit breakers.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive panelboards.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.
- D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- E. Provide required support and attachment in accordance with Section 26 0529.
- F. Install panelboards plumb.

- G. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.
- H. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor or working platform.
- I. Provide minimum of six spare 1 inch trade size conduits out of each flush-mounted panelboard stubbed into accessible space above ceiling and below floor.
- J. Provide grounding and bonding in accordance with Section 26 0526.
- K. Install all field-installed branch devices, components, and accessories.
- L. Set field-adjustable circuit breaker tripping function settings as determined by overcurrent protective device coordination study performed according to Section 26 0573.
- M. Set field-adjustable ground fault protection pickup and time delay settings as indicated.
- N. Install panelboards in accordance with NEMA PB 1.1 and NECA 1.
- O. Install panelboards plumb. Install recessed panelboards flush with wall finishes. Install surface-mount type panelboards and load centers using spacers to stand enclosure a minimum of 1/8" from wall or mounting surface. Provide supports in accordance with Section 26 0529.
- P. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.
 - 1. Refer to drawings for panelboards with special mounting height requirements.
- Q. Provide filler plates to cover unused spaces in panelboards.
- R. Identify panelboards in accordance with Section 26 0553.
- S. Provide computer-generated circuit directory for each lighting and appliance panelboard and each power distribution panelboard provided with a door, clearly and specifically indicating the loads served. Identify spares and spaces.
- T. Provide engraved plastic nameplates identifying each panelboard or load center.
- U. Provide arc flash warning labels in accordance with NFPA 70.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Perform field inspection and testing in accordance with Section 01 4000.
- C. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.
- D. Inspect and test in accordance with NETA ATS, except Section 4.
- E. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1. Tests listed as optional are not required.
- F. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions as required by NFPA 70.
- G. Test GFCI circuit breakers to verify proper operation.
- H. Test AFCI circuit breakers to verify proper operation.
- I. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.04 SCHEDULES

- A. See panelboard schedule on drawings for individual panelboard requirements.

3.05 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

- B. Adjust alignment of panelboard fronts.
- C. Load Balancing: For each panelboard, rearrange circuits such that the difference between each measured steady state phase load does not exceed 20 percent and adjust circuit directories accordingly. Maintain proper phasing for multi-wire branch circuits.

3.06 CLEANING

- A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 26 2416

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**SECTION 26 2419
MOTOR-CONTROL CENTERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Low-voltage (600 V and less) standard (non-arc-resistant) NEMA motor control centers.
- B. Motor control center units:
 - 1. Feeder units.
 - 2. Combination magnetic motor starter units.
 - 3. Variable-Frequency AC Drive Units.
- C. Overcurrent protective devices for motor control centers and associated units, including overload relays.
- D. Motor control accessories:
 - 1. Auxiliary contacts.
 - 2. Pilot devices.
 - 3. Control and timing relays.
 - 4. Control power transformers.
 - 5. Control terminal blocks.
- E. Motor control centers.
 - 1. Refer to the Drawings for additional details and component selections pertaining to the motor control centers.
- F. The Systems Integrator, specified in Section 25 1300 - Instrumentation and Control Integration, shall be responsible for supplying and commissioning the equipment specified in this section. Installation shall be by the Division 26 Contractor.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- C. Section 26 0529 - Hangers and Supports for Electrical Systems.
- D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 26 0573 - Power System Studies: Additional criteria for the selection and adjustment of equipment and associated protective devices specified in this section.
- F. Section 26 2923 - Variable-Frequency Motor Controllers.
- G. Section 26 4300 - Surge Protective Devices.

1.03 REFERENCE STANDARDS

- A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service.
- B. IEEE C57.13 - IEEE Standard Requirements for Instrument Transformers.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- D. NECA 402 - Standard for Installing and Maintaining Motor Control Centers.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- F. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts.
- G. NEMA ICS 2.3 - Industrial Control and Systems: Instructions for the Handling, Installation, Operation, and Maintenance of MCCs Rated Not More Than 600 Volts.
- H. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
- I. NEMA ICS 6 - Industrial Control and Systems: Enclosures.
- J. NEMA ICS 18 - Motor Control Centers.

- K. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum).
- L. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- M. NFPA 70 - National Electrical Code.
- N. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
- O. UL 845 - Motor Control Centers.
- P. UL 1053 - Ground-Fault Sensing and Relaying Equipment.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.
 - 2. Coordinate the work to provide motor controllers and associated overload relays suitable for use with the actual motors to be installed.
 - 3. Coordinate the work to provide motor controllers and associated wiring suitable for interface with control devices to be installed.
 - 4. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 5. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
 - 6. Coordinate with manufacturer to provide shipping splits suitable for the dimensional constraints of the installation.
 - 7. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for motor control centers, enclosures, units, overcurrent protective devices, and other installed components and accessories.
 - 1. Include characteristic trip curves for each type and rating of overcurrent protective device upon request.
- C. Shop Drawings: Indicate dimensions, voltage, bus ampacities, unit arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
 - 1. Include dimensioned plan and elevation views of motor control centers and adjacent equipment with all required clearances indicated.
 - 2. Include wiring diagrams showing all factory and field connections.
- D. Project Record Documents: Record actual installed locations of motor control centers and final equipment settings.
 - 1. Include nameplate data of actual installed motors and associated overload relay selections and settings.
 - 2. Motor Circuit Protectors: Include magnetic instantaneous trip settings.
- E. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Enclosure Keys: Two of each different key.
 - 3. Indicating Lights: Two of each different type.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store motor control centers in accordance with manufacturer's instructions, NECA 402, and NEMA ICS 2.3.
- B. Store in a clean, dry space having a uniform temperature to prevent condensation. Where necessary, provide temporary enclosure space heaters or temporary power for permanent factory-installed space heaters.
- C. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- D. Handle carefully to avoid damage to internal components, enclosure, and finish.

1.09 FIELD CONDITIONS

- A. Maintain field conditions within required service conditions during and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Motor Control Centers:
 - 1. Rockwell Automation, Inc.; Allen-Bradley Products: ab.rockwellautomation.com/#sle.
 - 2. Schneider Electric; Square D Products: www.schneider-electric.us/#sle.
 - 3. Source Limitations: Provide motor control centers and associated components produced by single manufacturer and obtained from single supplier.

2.02 MOTOR CONTROL CENTERS

- A. Provide motor control centers consisting of all required components, control power transformers, instrumentation and control wiring, accessories, etc. as necessary for a complete operating system.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Description: Dead-front standard (non-arc-resistant) type motor control center assemblies complying with NEMA ICS 18, and listed and labeled as complying with UL 845; ratings, configurations and features as indicated on the drawings.
- D. Configuration:
 - 1. Arrangement: Front-mounted units only (no rear-mounted units or back-to-back configuration).
 - 2. NEMA Classification and Wiring Type: NEMA ICS 18, Class I, Type B (B-T for units size 3 or smaller).
- E. Service Conditions:
 - 1. Provide motor control centers and associated components suitable for operation under the following service conditions without derating:
 - a. Altitude:
 - 1) Class 1 Km Equipment (devices utilizing power semiconductors, e.g. variable frequency controllers): Less than 3,300 feet.

- 2) Class 2 Km Equipment (electromagnetic and manual devices): Less than 6,600 feet.
 - b. Ambient Temperature: Between 32 degrees F and 104 degrees F.
2. Provide motor control centers and associated components suitable for operation at indicated ratings under the service conditions at the installed location.
- F. Short Circuit Current Rating:
 1. Provide motor control centers and associated units with listed short circuit current rating not less than the available fault current at the installed location as determined by short circuit study performed in accordance with Section 26 0573.
 2. Minimum Rating: 42,000 rms symmetrical amperes.
 3. Listed series ratings are not acceptable.
- G. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.
- H. Main Devices: Configure for top or bottom incoming feed as indicated or as required for the installation. Provide top-mounted pullbox as indicated or as required to facilitate installation of incoming feed.
- I. Bussing:
 1. Horizontal Main Bus: Size for a maximum temperature rise of 117 degrees F over an ambient temperature of 104 degrees F, in compliance with NEMA ICS 18 and UL 845 requirements.
 2. Vertical Bus: Minimum size of 300 A, in compliance with NEMA ICS 18 requirements.
 3. Provide solidly bonded equipment ground bus through full length of motor control center, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
 4. Phase and Neutral Bus Material: Copper.
 5. Ground Bus Material: Copper.
- J. Conductor Terminations: Suitable for use with the conductors to be installed.
 1. Line Conductor Terminations:
 - a. Main and Neutral Lug Material: Copper, suitable for terminating copper conductors only.
 - b. Main and Neutral Lug Type: Mechanical.
- K. Enclosures:
 1. Comply with NEMA ICS 6.
 2. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: Type 1 or Type 2 (drip-proof).
 3. Finish: Manufacturer's standard unless otherwise indicated.
- L. Future Provisions:
 1. Prepare designated spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.
 2. Arrange and equip horizontal bus and ground bus to accommodate future installation of additional motor control sections.
 3. Provide spare compartments with blank doors in MCC as indicated on the drawings..
- M. Surge Protective Devices: Comply with Section 26 4300.
- N. Phase Failure Relays: Phase failure relays shall be SymCom Motor Saver, Model 460 and shall be installed in the MCC.
- O. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
 1. Where overcurrent protective devices equipped with integral ground fault protection are used, provide separate neutral current sensor where applicable.
 2. Where accessory ground fault sensing and relaying equipment is used, equip companion overcurrent protective devices with ground-fault shunt trips.

- a. Use zero sequence or residual ground fault detection method unless otherwise indicated.
 - b. Provide test panel and field-adjustable ground fault pick-up and delay settings.
- P. Arc Flash Energy-Reducing Maintenance Switching: For circuit breakers rated 1200 A or higher, provide a local accessory switch with status indicator light that permits selection of a maintenance mode with alternate electronic trip unit settings for reduced fault clearing time.
- Q. Instrument Transformers:
 - 1. Comply with IEEE C57.13.
 - 2. Select suitable ratio, burden, and accuracy as required for connected devices.
 - 3. Current Transformers: Connect secondaries to shorting terminal blocks.
 - 4. Potential Transformers: Include primary and secondary fuses with disconnecting means.

2.03 MOTOR CONTROL CENTER UNITS

- A. Feeder Units: Circuit breaker type.
- B. Combination Magnetic Motor Starter Units:
 - 1. Description: NEMA ICS 2, Class A combination motor controllers with magnetic contactor(s), externally operable disconnect and overload relay(s).
 - 2. Configuration: Full-voltage non-reversing type unless otherwise indicated.
 - 3. Disconnects: Circuit breaker type.
 - a. Circuit Breakers: Motor circuit protectors (magnetic-only) unless otherwise indicated or required.
 - b. Provide externally operable handle with means for locking in the OFF position. Provide safety interlock to prevent opening the cover with the disconnect in the ON position with capability of overriding interlock for testing purposes.
 - c. Provide auxiliary interlock for disconnection of external control power sources where applicable.
 - 4. Overload Relays: Solid-state type unless otherwise indicated.
 - 5. Pilot Devices Required:
 - a. Furnish local pilot devices for each unit as specified below unless otherwise indicated on drawings.
 - b. Single-Speed, Non-Reversing Starters:
 - 1) Selector Switches: HAND/OFF/AUTO.
 - 2) Indicating Lights: Green ON.
- C. Variable-Frequency AC Drive Units: Comply with Section 26 2923.

2.04 OVERCURRENT PROTECTIVE DEVICES

- A. Overload Relays:
 - 1. Provide overload relays and, where applicable, associated current elements/heaters, selected according to actual installed motor nameplate data, in accordance with manufacturer's recommendations and NFPA 70; include consideration for motor service factor and ambient temperature correction, where applicable.
 - 2. Inverse-Time Trip Class Rating: Class 20 unless otherwise indicated or required.
 - 3. Trip-free operation.
 - 4. Visible trip indication.
 - 5. Resettable.
 - a. Employ manual reset unless otherwise indicated.
 - b. Do not employ automatic reset with two-wire control.
 - 6. Solid-State Overload Relays:
 - a. Selectable inverse-time trip class rating; available ratings of Class 10, 20, and 30, minimum.
 - b. Adjustable full load current.
 - c. Phase loss protection.

- d. Phase imbalance protection.
 - e. Ambient temperature insensitive.
 - f. Thermal memory.
 - g. Trip test function.
 - h. Provide isolated alarm contact.
- B. Circuit Breakers:
- 1. Interrupting Capacity (not applicable to motor circuit protectors):
 - a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than specified minimum requirements.
 - b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
 - 2. Motor Circuit Protectors:
 - a. Description: Instantaneous-trip circuit breakers furnished with magnetic instantaneous tripping elements for short circuit protection, but not with thermal inverse time tripping elements for overload protection; UL 489 recognized only for use as part of a listed combination motor controller with overload protection; ratings, configurations, and features as indicated on the drawings.
 - b. Provide field-adjustable magnetic instantaneous trip setting.
 - c. Provide the following features and accessories where indicated or where required to complete installation:
 - 1) Pad-Lock Provision: For locking circuit breaker handle in OFF position.
 - 3. Molded Case Circuit Breakers:
 - a. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers; listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
 - 1) Provide thermal magnetic circuit breakers unless otherwise indicated.
 - 2) Provide electronic trip circuit breakers where indicated.
 - b. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
 - 1) Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
 - c. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
 - 1) Provide the following field-adjustable trip response settings:
 - (a) Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
 - (b) Long time delay.
 - (c) Short time pickup and delay.
 - (d) Instantaneous pickup.
 - (e) Ground fault pickup and delay where ground fault protection is indicated.
 - d. Provide the following circuit breaker types where indicated:
 - 1) 100 Percent Rated Circuit Breakers: Listed for application within the motor control center where installed at 100 percent of the continuous current rating.
 - e. Provide the following features and accessories where indicated or where required to complete installation:
 - 1) Pad-Lock Provision: For locking circuit breaker handle in OFF position.

2.05 MOTOR CONTROL ACCESSORIES

- A. Auxiliary Contacts:
- 1. Comply with NEMA ICS 5.

2. Provide number and type of contacts indicated or required to perform necessary functions, including holding (seal-in) circuit and interlocking, plus one normally open (NO) and one normally closed (NC) spare contact for each starter unit, minimum.
- B. Pilot Devices:
1. Comply with NEMA ICS 5; heavy-duty type.
 2. Nominal Size: 30 mm.
 3. Pushbuttons: Unless otherwise indicated, provide momentary, non-illuminated type with flush button operator; normally open or normally closed as indicated or as required.
 4. Selector Switches: Unless otherwise indicated, provide maintained, non-illuminated type with knob operator; number of switch positions as indicated or as required.
 5. Indicating Lights: Push-to-test type unless otherwise indicated.
 6. Provide LED lamp source for indicating lights and illuminated devices.
- C. Control and Timing Relays:
1. Comply with NEMA ICS 5.
 2. Provide number and type of relays indicated or required to perform necessary functions.
 3. Current Threshold Relays (where indicated, for ventilation system monitoring): Relays shall be self-powered, AC current operated, with 1-150A adjustable trip, split core, and one normally closed output contact; NK Technologies AS1 Series, or equal. Install in feeder or motor controller compartment for load being monitored. For circuits fed from panelboards, provide empty MCC compartment to locate in. Wrap motor lead around CT multiple times if required for pickup sensitivity.
- D. Control Power Transformers:
1. Size to accommodate burden of contactor coil(s) and all connected auxiliary devices, plus 50 VA spare capacity.
 2. Include primary and secondary fuses.
- E. Control Terminal Blocks: Include 25 percent spare terminals.

2.06 SOURCE QUALITY CONTROL

- A. Shop inspect and perform standard productions tests for each controller. Provide test results in a report to be included with O&M Manuals.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings and configurations of the motor control centers and associated components are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive motor control centers.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install motor control centers in accordance with NECA 1 (general workmanship), NECA 402, and NEMA ICS 2.3.
- C. Arrange equipment to provide required clearances and maintenance access, including accommodations for any drawout devices.
- D. Provide required support and attachment in accordance with Section 26 0529.
- E. Install motor control centers plumb and level.
- F. Unless otherwise indicated, mount motor control centers on properly sized 4 inch high concrete pad constructed in accordance with Section 03 3000.
- G. Provide grounding and bonding in accordance with Section 26 0526.

- H. Install all field-installed devices, components, and accessories.
- I. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
- J. Set field-adjustable motor controllers and associated components according to installed motor requirements, in accordance with manufacturer's recommendations and NFPA 70.
- K. Set field-adjustable circuit breaker tripping function settings as determined by overcurrent protective device coordination study performed in accordance with Section 26 0573.
- L. Set field-adjustable ground fault protection pickup and time delay settings as indicated.
- M. Provide filler plates to cover unused spaces.
- N. Identify motor control centers in accordance with Section 26 0553.
- O. Select and install heater elements and/or set proper current rating on electronic overload relays in motor starters to match installed motor characteristics.
- P. Provide a plastic engraved nameplate on the exterior of each cubicle and one for the MCC assembly for load/equipment identification.
- Q. Motor Data: Neatly type label inside each motor starter door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating. Place label in clear plastic holder.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.
- C. Before energizing motor control center, perform insulation resistance testing in accordance with NECA 402 and NEMA ICS 2.3.
- D. Perform inspections and tests listed in NETA ATS, Section 7.16.2.1.
- E. Motor Starters: Perform inspections and tests listed in NETA ATS, Section 7.16.1.1. Tests listed as optional are not required.
- F. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions as required by NFPA 70.
 - 1. Perform inspections and tests listed in NETA ATS, Section 7.14. The insulation-resistance test on control wiring listed as optional is not required.
- G. Instrument Transformers: Perform inspections and tests listed in NETA ATS, Section 7.10. The dielectric withstand tests on primary windings with secondary windings connected to ground listed as optional are not required.
- H. Correct deficiencies and replace damaged or defective motor control centers or associated components.

3.04 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
- B. Adjust alignment of motor control center covers and doors.

3.05 CLEANING

- A. Clean dirt and debris from motor control center enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred surfaces to match original factory finish.

3.06 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of motor controllers to Owner, and correct deficiencies or make adjustments as directed.
- B. Training: Train Owner's personnel on operation, adjustment, and maintenance of motor control center and associated devices.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours of training.
 - 3. Instructor: Manufacturer's authorized representative.
 - 4. Location: At project site.

3.07 PROTECTION

- A. Protect installed motor control centers from subsequent construction operations.

END OF SECTION 26 2419

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**SECTION 26 2726
WIRING DEVICES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Receptacles.
- B. Wall plates and covers.

1.02 RELATED REQUIREMENTS

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0533.16 - Boxes for Electrical Systems.
- C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- C. NECA 130 - Standard for Installing and Maintaining Wiring Devices.
- D. NEMA WD 1 - General Color Requirements for Wiring Devices.
- E. NEMA WD 6 - Wiring Devices - Dimensional Specifications.
- F. NFPA 70 - National Electrical Code.
- G. UL 498 - Attachment Plugs and Receptacles.
- H. UL 514D - Cover Plates for Flush-Mounted Wiring Devices.
- I. UL 943 - Ground-Fault Circuit-Interrupters.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
 - 3. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
 - 4. Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.
- B. Sequencing:

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
- C. Project Record Documents: Record actual installed locations of wiring devices.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Products: Listed, classified, and labeled as suitable for the purpose intended.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store wiring devices in a dry location.

- B. Store in such a manner that the wiring devices will not be damaged.

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. GE Wiring Devices.
- B. Hubbell.
- C. Leviton Manufacturing, Inc.
- D. Pass & Seymour.
- E. Engineer approved equivalent.

2.02 WIRING DEVICE APPLICATIONS

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
- D. Provide GFCI protection for receptacles installed within 6 feet of sinks.
- E. Provide GFCI protection for receptacles installed in kitchens.
- F. Unless noted otherwise, do not use combination switch/receptacle devices.
- G. Provide Class I Division 1 or Class I Division 2 rated receptacles, as required for hazardous environments.

2.03 WIRING DEVICE FINISHES

- A. Provide wiring device finishes as described below unless otherwise indicated.
- B. Wiring Devices Installed in Finished Spaces: Ivory with stainless steel wall plate.
- C. Wiring Devices Installed in Unfinished Spaces: Ivory with galvanized steel wall plate.
- D. Wiring Devices Installed in Wet or Damp Locations: Ivory with specified weatherproof cover.

2.04 ALL WIRING DEVICES

- A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.05 RECEPTACLES

- A. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498 and where applicable FS W-C-596; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
 - 2. NEMA configurations specified are according to NEMA WD 6.
- B. Convenience Receptacles:
 - 1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
 - 2. Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as weather resistant type complying with UL 498 Supplement SD suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.

C. GFCI Receptacles:

1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SD suitable for installation in damp or wet locations.

2.06 WALL PLATES AND COVERS

A. Wall Plates: Comply with UL 514D.

1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
2. Size: Standard.
3. Screws: Metal with slotted heads finished to match wall plate finish.

B. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

C. Galvanized Steel Wall Plates: Rounded corners and edges, with corrosion resistant screws.

D. Weatherproof Receptacle Covers for Wet or Damp Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

2.07 LOCAL CONTROL STATIONS

A. Provide local control stations with three-position rotary type switches where indicated on the Drawings. The NEMA enclosure rating and function of switch positions shall be as indicated on the Drawings. Each switch shall be supplied with a minimum of four isolated contacts.

B. Allen-Bradley, NEMA style, Bulletin 800, 30 mm, or equivalent.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.
 1. Mounting Heights: Unless otherwise indicated, as follows:
 - a. Receptacles: 18 inches above finished floor or 6 inches above counter.
 2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.

3. Where multiple receptacles are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
 4. Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.
- C. Install wiring devices in accordance with manufacturer's instructions.
 - D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
 - E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
 - F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
 - G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
 - H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
 - I. Where split-wired duplex receptacles are indicated, remove tabs connecting top and bottom receptacles.
 - J. Install in accordance with manufacturer's instructions.
 - K. Install wiring devices plumb and level with mounting yoke held rigidly in place.
 - L. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
 - M. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
 - N. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
 - O. Identify wiring devices in accordance with Section 26 0553.
 - P. Connect wiring device grounding terminal to outlet box with bonding jumper.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect each wiring device for damage and defects.
- C. Verify that each receptacle device is energized.
- D. Test each receptacle to verify operation and proper polarity.
- E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
- F. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

3.06 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION 26 2726

SECTION 26 2813 FUSES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fuses.

1.02 RELATED REQUIREMENTS

- A. Section 26 0573 - Power System Studies: Additional criteria for the selection of protective devices specified in this section.
- B. Section 26 2816.16 - Enclosed Switches: Fusible switches.

1.03 REFERENCE STANDARDS

- A. NEMA FU 1 - Low Voltage Cartridge Fuses.
- B. NFPA 70 - National Electrical Code.
- C. UL 248-1 - Low-Voltage Fuses - Part 1: General Requirements.
- D. UL 248-4 - Low-Voltage Fuses - Part 4: Class CC Fuses.
- E. UL 248-8 - Low-Voltage Fuses - Part 8: Class J Fuses.
- F. UL 248-10 - Low-Voltage Fuses - Part 10: Class L Fuses.
- G. UL 248-12 - Low-Voltage Fuses - Part 12: Class R Fuses.
- H. UL 248-15 - Low-Voltage Fuses - Part 15: Class T Fuses.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate fuse clips furnished in equipment provided under other sections for compatibility with indicated fuses.
 - 2. Coordinate fuse requirements according to manufacturer's recommendations and nameplate data for actual equipment to be installed.
 - 3. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Provide manufacturer's standard data sheets including voltage and current ratings, interrupting ratings, time-current curves, and current limitation curves.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Fuses: One set(s) of three for each type and size installed.
 - 3. Fuse Pullers: One set(s) compatible with each type and size installed.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- C. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Bussmann, a division of Eaton Corporation: www.cooperindustries.com/#sle.
- B. Littelfuse, Inc: www.littelfuse.com/#sle.

- C. Mersen: ep-us.mersen.com/#sle.

2.02 APPLICATIONS

- A. Feeders:
 - 1. Fusible Switches up to 600 Amperes: Class RK1, time-delay.
- B. General Purpose Branch Circuits: Class RK1, time-delay.
- C. Individual Motor Branch Circuits: Class RK1, time-delay.
- D. In-Line Protection for Pole-Mounted Luminaires: Class CC, time-delay.
- E. Primary Protection for Control Transformers: Class CC, time-delay.

2.03 FUSES

- A. Provide products listed, classified, and labeled as suitable for the purpose intended.
- B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.
- C. Provide fuses of the same type, rating, and manufacturer within the same switch.
- D. Comply with UL 248-1.
- E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.
- F. Voltage Rating: Suitable for circuit voltage.
- G. Class R Fuses: Comply with UL 248-12.
- H. Class CC Fuses: Comply with UL 248-4.
- I. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.
- J. Provide the following accessories where indicated or where required to complete installation:
 - 1. Fuseholders: Compatible with indicated fuses.
 - 2. Fuse Reducers: For adapting indicated fuses to permit installation in switch designed for fuses with larger ampere ratings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that fuse ratings are consistent with circuit voltage and manufacturer's recommendations and nameplate data for equipment.
- B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Do not install fuses until circuits are ready to be energized.
- B. Install fuses with label oriented such that manufacturer, type, and size are easily read.

END OF SECTION 26 2813

**SECTION 26 2816.16
ENCLOSED SWITCHES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Enclosed safety switches.

1.02 RELATED REQUIREMENTS

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 0529 - Hangers and Supports for Electrical Systems.
- C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- D. Section 26 0573 - Power System Studies: Additional criteria for the selection of equipment and associated protective devices specified in this section.
- E. Section 26 2813 - Fuses.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- C. NEMA AB 1 - Molded Case Circuit Breakers.
- D. NEMA FU 1 - Low Voltage Cartridge Fuses; National Electrical Manufacturers Association; 2002 (R2007).
- E. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum).
- F. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- G. NFPA 70 - National Electrical Code.
- H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations.
- I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations.
- J. UL 98 - Enclosed and Dead-Front Switches.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
 - 4. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
- C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.

- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- E. Project Record Documents: Record actual locations of enclosed switches.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

1.08 FIELD CONDITIONS

- A. Maintain ambient temperature between -22 degrees F and 104 degrees F during and after installation of enclosed switches.
- B. Perform Work in accordance with NECA Standard of Installation.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.
- D. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.09 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. ABB: www.electrification.us.abb.com/#sle.
- B. Eaton Corporation: www.eaton.com/#sle.
- C. Schneider Electric: www.se.com/#sle.
- D. Engineer approved equivalent.

2.02 ENCLOSED SAFETY SWITCHES

- A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
 - 1. Altitude: Less than 6,600 feet.
 - 2. Ambient Temperature: Between -22 degrees F and 104 degrees F.
- D. Horsepower Rating: Suitable for connected load.

- E. Voltage Rating: Suitable for circuit voltage.
- F. Short Circuit Current Rating:
 - 1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location as determined by short circuit study performed in accordance with Section 26 0573.
- G. Provide with switch blade contact position that is visible when the cover is open.
- H. Fuse Clips for Fusible Switches: As required to accept fuses indicated.
 - 1. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.
- I. Conductor Terminations: Suitable for use with the conductors to be installed.
- J. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
- K. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- L. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
 - 1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Indoor Clean, Dry Locations: Type 1.
 - b. Outdoor Locations: Type 4X, stainless steel.
 - 2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.
- M. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
- N. Heavy Duty Switches:
 - 1. Comply with NEMA KS 1.
 - 2. Conductor Terminations:
 - a. Lug Material: Copper, suitable for terminating copper conductors only.
 - 3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.
 - a. Provide means for locking handle in the ON position where indicated.
- O. Provide the following features and accessories where indicated or where required to complete installation:
 - 1. Auxiliary Switch: SPDT switch suitable for connection to system indicated, with auxiliary contact operation before switch blades open and after switch blades close.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive enclosed safety switches.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

- D. Provide required support and attachment in accordance with Section 26 0529.
- E. Install enclosed switches plumb.
- F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
- G. Provide grounding and bonding in accordance with Section 26 0526.
- H. Provide fuses complying with Section 26 2813 for fusible switches as indicated or as required by equipment manufacturer's recommendations.
- I. Identify enclosed switches in accordance with Section 26 0553.
- J. Provide arc flash warning labels in accordance with NFPA 70.
- K. Install NEMA KS 1 type disconnects using spacers to stand enclosure a minimum of 1/8" from wall or mounting surface.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
- D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.04 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

- A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.
- C. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections.

END OF SECTION 26 2816.16

SECTION 26 2923
VARIABLE-FREQUENCY MOTOR CONTROLLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Variable frequency controllers.
- B. The Systems Integrator, specified in Section 25 1300 - Instrumentation and Control Integration, shall be responsible for supplying and commissioning the equipment specified in this section. Installation shall be by the Division 26 Contractor.
- C. Overcurrent protective devices for motor controllers, including overload relays.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Housekeeping pads.
- B. Section 26 0519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES: Variable-frequency drive cable.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- D. Section 26 0529 - Hangers and Supports for Electrical Systems.
- E. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 26 0573 - Power System Studies: Additional criteria for selection and adjustment of equipment and associated protective devices specified in this section.
- G. Section 26 2419 - Motor-Control Centers.
- H. Section 26 2813 - Fuses.
- I. Section 26 3526 - Low-Voltage Active Harmonic Filters.
- J. Section 26 3533.16 - Low-Voltage Power Factor Correction Equipment.

1.03 REFERENCE STANDARDS

- A. IEC 60529 - Degrees of Protection Provided by Enclosures (IP Code).
- B. IEEE C57.13 - IEEE Standard Requirements for Instrument Transformers.
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- E. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
- F. NEMA ICS 6 - Industrial Control and Systems: Enclosures.
- G. NEMA ICS 7 - Industrial Control and Systems: Adjustable-Speed Drives.
- H. IEEE 519 - IEEE Recommended Practice and Requirements for Harmonic Control in Electrical Power Systems.
- I. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable-Speed Drive Systems.
- J. NEMA ICS 7.2 - Application Guide for AC Adjustable Speed Drive Systems.
- K. NEMA ICS 61800-2 - Adjustable Speed Electrical Power Drive Systems, Part 2: General Requirements-Rating Specifications for Low Voltage Adjustable Frequency AC Power Drive Systems.
- L. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum).
- M. NEMA MG 1 - Motors and Generators.
- N. NEMA ICS 7 - Industrial Control and Systems: Adjustable-Speed Drives.
- O. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

- P. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- Q. NFPA 70 - National Electrical Code.
- R. UL 98 - Enclosed and Dead-Front Switches.
- S. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
- T. UL 508A - Industrial Control Panels.
- U. UL 61800-5-1 - Standard for Adjustable Speed Electrical Power Drive Systems - Part 5-1: Safety Requirements – Electrical, Thermal, and Energy (Ed. 2).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within dedicated equipment spaces and working clearances required by NFPA 70.
 - 2. Coordinate work to provide motor controllers suitable for use with actual motors to be installed.
 - 3. Coordinate work to provide controllers and associated wiring suitable for interface with control devices to be installed.
 - 4. Coordinate arrangement of electrical equipment with dimensions and clearance requirements of actual equipment to be installed.
 - 5. Verify with manufacturer that conductor terminations are suitable for use with conductors to be installed.
 - 6. Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.
- C. Shop Drawings: Indicate front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; and nameplate legends.
 - 1. Include dimensioned plan and elevation views of controllers and adjacent equipment with required clearances indicated.
 - 2. Include wiring diagrams showing factory and field connections.
- D. Specimen Warranty: Submit sample of manufacturer's warranty.
- E. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- F. Field quality control test reports.
- G. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
- H. Executed Warranty: Submit documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- I. Operation Data: NEMA ICS 7.1. Include instructions for starting and operating controllers, and describe operating limits that may result in hazardous or unsafe conditions.
- J. Maintenance Data: NEMA ICS 7.1. Include routine preventive maintenance schedule.
- K. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Air Filters: Two of each type.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.
- C. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to components, enclosure, and finish.

1.08 FIELD CONDITIONS

- A. Maintain field conditions within required service conditions during and after installation.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide minimum two year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Variable Frequency Motor Controllers:
 1. Rockwell Automation, Inc.; Allen-Bradley Products;[755 AC]:
ab.rockwellautomation.com/#sle.
 2. Schneider Electric; Square D Products;[ATV630]: www.schneider-electric.us/#sle.
- B. Substitutions: Not permitted.
- C. Source Limitations: Furnish variable frequency motor controllers and associated components produced by a single manufacturer and obtained from a single supplier.

2.02 VARIABLE-FREQUENCY MOTOR CONTROLLERS

- A. Provide variable-frequency motor control system consisting of required controller assemblies, operator interfaces, control power transformers, instrumentation and control wiring, sensors, accessories, system programming, etc. as necessary for complete operating system.
- B. Provide products listed, classified, and labeled as suitable for purpose intended.
- C. Variable-Frequency Motor Controller:
 1. Configuration: Packaged controller, nonbypass.
 2. Rectifier/Converter: Diode-based, 6-pulse type.
 3. Control Method: Vector; open-loop, without feedback.
 4. Filtering: Provide 5% line reactors for all VFDs.
- D. Controller Assemblies: Comply with NEMA ICS 7, NEMA ICS 7.1, and NEMA ICS 61800-2; list and label as complying with UL 61800-5-1 or UL 508A as applicable.
- E. Provide controllers selected for actual installed motors and coupled mechanical loads in accordance with NEMA ICS 7.2, NEMA MG 1 Part 30, and recommendations of manufacturers of both controller and load, where not in conflict with specified requirements; considerations include, but are not limited to:
 1. Motor type (e.g., induction, reluctance, and permanent magnet); consider NEMA MG 1 design letter or inverter duty rating for induction motors.
 2. Motor load type (e.g., constant torque, variable torque, and constant horsepower); consider duty cycle, impact loads, and high inertia loads.

3. Motor nameplate data.
4. Requirements for speed control range, speed regulation, and braking.
- F. Devices on Load Side of Controller: Suitable for application across full controller output frequency range.
- G. Operating Requirements:
 1. Input Voltage Tolerance: Plus/minus 10 percent of nominal.
 2. Input Frequency Tolerance: Plus/minus 5 percent of nominal.
 3. Efficiency: Minimum of 96 percent at full speed and load.
 4. Input Displacement Power Factor: Minimum of 0.96 throughout speed and load range.
 5. Overload Rating:
 - a. Variable Torque Loads: Minimum of 110 percent of nominal for 60 seconds.
 - b. Constant Torque Loads: Minimum of 150 percent of nominal for 60 seconds.
 6. Volts Per Hertz Adjustment: Plus or minus 10 percent.
 7. Current Limit Adjustment: 60 to 110 percent of rated.
 8. Acceleration Rate Adjustment: 0.5 to 30 seconds.
 9. Deceleration Rate Adjustment: 1 to 30 seconds.
- H. Power Conversion System: Microprocessor-based, pulse width modulation type consisting of rectifier/converter, DC bus/link, and inverter.
 1. Rectifier/Converter: Diode-based, 6-pulse type unless otherwise indicated.
- I. Control System:
 1. Provide microprocessor-based control system for automatic control, monitoring, and protection of motors. Include sensors, wiring, and connections necessary for functions and status/alarm indications specified.
 2. Provide integral operator interface for controller programming, display of status/alarm indications, fault reset, and local control functions including motor run/stop, motor forward/reverse selection, motor speed increase/decrease, and local/remote control selection.
 3. Control Functions:
 - a. Control Method: Selectable vector and scalar/volts per hertz unless otherwise indicated.
 - 1) Scalar/Volts per Hertz Control: Provide IR compensation for improved low-speed torque.
 - 2) Vector Control: Provide selectable autotuning function.
 - b. Adjustable acceleration and deceleration time; linear and S-curve ramps; selectable coast to stop.
 - c. Selectable braking control; DC injection or flux braking.
 - d. Adjustable minimum/maximum speed limits.
 - e. Adjustable pulse width modulation switching carrier frequency.
 - f. Adjustable motor slip compensation.
 - g. Selectable autorestart after noncritical fault; programmable number of time delay between restart attempts.
 4. Status Indications:
 - a. Motor run/stop status.
 - b. Motor forward/reverse status.
 - c. Local/remote control status.
 - d. Output voltage.
 - e. Output current.
 - f. Output frequency.
 - g. DC bus voltage.
 - h. Motor speed.
 5. Protective Functions/Alarm Indications:
 - a. Overcurrent.

- b. Motor overload.
 - c. Undervoltage.
 - d. Overvoltage.
 - e. Controller overtemperature.
 - f. Input/output phase loss.
 - g. Output short circuit protection.
 - h. Output ground fault protection.
- 6. Inputs:
 - a. Digital Input(s): Three.
 - b. Analog Input(s): Two.
- 7. Outputs:
 - a. Analog Output(s): One.
 - b. Relay Output(s): Two.
- 8. Communications: Compatible with connected systems. Provide accessories necessary for proper interface.
 - a. Ethernet Communications: Support for ODVA Compliant EtherNet I/P communications protocol.
 - b. Remote Monitoring Capabilities:
 - 1) Motor run/stop status.
 - 2) Hand-off-auto status.
 - 3) Fault information.
 - 4) Discrete input/output status.
 - 5) Analog input/output values.
 - c. Remote Control Capabilities:
 - 1) Motor run/stop command.
 - 2) Hand-off-auto selection.
 - 3) Speed adjustment.
- 9. Features:
 - a. Password-protected security access.
 - b. Event log.
- J. Power Conditioning/Filtering:
 - 1. Provide DC link choke and input/line reactor for each controller unless otherwise indicated or required.
 - 2. Provide where indicated:
 - a. Input/line reactor.
 - b. Output/load reactor.
 - c. Output dV/dt filter.
 - 3. Reactor Impedance: 3 percent, unless otherwise indicated or required.
- K. Packaged Controllers: Controllers factory-approved in separate enclosure with externally operable disconnect and specified accessories.
 - 1. Disconnects: Circuit breaker or disconnect switch type.
 - a. Disconnect Switches: Fusible type or non-fusible type with separate input fuses.
 - b. Provide externally operable handle with means for locking in OFF position. Provide safety interlock to prevent opening cover with disconnect in ON position with capability of overriding interlock for testing purposes.
 - c. Provide auxiliary interlock for disconnection of external control power sources where applicable.
 - 2. Provide door-mounted remote operator interface.
 - 3. Provide high-speed fuses for protection of electronics.
 - 4. Provide dV/dT output filters where indicated on Drawings.
 - 5. Pilot Devices Required:

- a. Furnish local pilot devices for each unit as specified below unless otherwise indicated on drawings, except where equivalent function is provided by remote operator interface.
 - b. Packaged Controllers:
 - 1) Selector Switches: Hand-Off-Auto.
 - 2) Indicating Lights: Running-Green, Fault-Red.
- L. Service Conditions:
 - 1. Provide controllers and associated components suitable for operation under following service conditions without derating:
 - a. Altitude: Less than 3,300 feet.
 - b. Ambient Temperature: Between 32 degrees F and 104 degrees F.
 - 2. Provide controllers and associated components suitable for operation at indicated ratings under service conditions at installed location.
- M. Short Circuit Current Rating:
 - 1. Provide controllers with listed short circuit current rating not less than available fault current at installed location as determined by short circuit study performed in accordance with Section 26 0573.
 - 2. Provide line/input reactors where specified by manufacturer for required short circuit current rating.
- N. Conductor Terminations: Suitable for use with conductors to be installed.
- O. Enclosures:
 - 1. Comply with NEMA ICS 6.
 - 2. NEMA 250 Environment Type or Equivalent IEC 60529 Rating: Unless otherwise indicated, as specified for following installation locations:
 - a. Indoor Clean, Dry Locations: Type 12.
 - 3. Finish: Manufacturer's standard unless otherwise indicated.
 - 4. Cooling: Forced air or natural convection as determined by manufacturer.
 - 5. If a particular manufacturer cannot meet the enclosure rating required, this manufacturer shall provide an enclosure which can meet the requirement, and in addition, provide a cooling system so that the drive can function in the ambient environment specified.
- P. Instrument Transformers:
 - 1. Comply with IEEE C57.13.
 - 2. Select suitable ratio, burden, and accuracy as required for connected devices.
 - 3. Current Transformers: Connect secondaries to shorting terminal blocks.
 - 4. Potential Transformers: Include primary and secondary fuses with disconnecting means.

2.03 OVERCURRENT PROTECTIVE DEVICES

- A. Fusible Disconnect Switches:
 - 1. Description: Quick-make, quick-break, dead-front fusible switch units complying with NEMA KS 1, and listed and labeled as complying with UL 98; ratings, configurations, and features as indicated or as required.
 - 2. Fuse Clips: As required to accept indicated fuses.
 - 3. Provide externally operable handle with means for locking in OFF position. Provide means for locking switch cover in closed position. Provide safety interlock to prevent opening of cover with switch in ON position with capability of overriding interlock for testing purposes.
- B. Circuit Breakers:
 - 1. Motor Circuit Protectors:
 - a. Description: Instantaneous-trip circuit breakers furnished with magnetic instantaneous tripping elements for short circuit protection, but not with thermal inverse time tripping elements for overload protection; UL 489 recognized only for use as part of listed combination motor controller with overload protection; ratings, configurations, and features as indicated or as required.
 - b. Provide field-adjustable magnetic instantaneous trip setting.

2.04 ACCESSORIES

- A. Auxiliary Contacts:
 - 1. Comply with NEMA ICS 5.
 - 2. Provide number and type of contacts indicated or required to perform necessary functions, including holding (seal-in) circuit and interlocking.
- B. Pilot Devices:
 - 1. Comply with NEMA ICS 5; heavy-duty type.
 - 2. Nominal Size: 30 mm.
 - 3. Pushbuttons: Unless otherwise indicated, provide momentary, nonilluminated type with flush button operator; normally open or normally closed as indicated or as required.
 - 4. Selector Switches: Unless otherwise indicated, provide maintained, nonilluminated type with knob operator; number of switch positions as indicated or as required.
 - 5. Indicating Lights: Push-to-test type unless otherwise indicated.
 - 6. Provide LED lamp source for indicating lights and illuminated devices.
- C. Control Power Transformers:
 - 1. Size to accommodate burden of contactor coil(s) and connected auxiliary devices, plus 50 VA spare capacity.
 - 2. Include primary and secondary fuses.
- D. Control Terminal Blocks: Include 25 percent spare terminals.

2.05 DESCRIPTION

- A. Variable Frequency Controllers: Enclosed controllers suitable for operating the indicated loads, in conformance with requirements of NEMA ICS 7. Select unspecified features and options in accordance with NEMA ICS 3.1.
 - 1. Employ microprocessor-based inverter logic isolated from power circuits.
 - 2. Employ pulse-width-modulated inverter system.
 - 3. Design to attempt five automatic restarts following fault condition before locking out and requiring manual restart.

2.06 GENERAL REQUIREMENTS

- A. Unless explicitly noted otherwise, at any time in the future, it shall be possible to substitute any standard motor (equivalent horsepower, voltage and RPM) in the field.
- B. Each Individual VFD shall be provided with RF attenuators, input line reactor assemblies, input isolating transformers, input harmonic traps, input current injection modules, and/or output filters as scheduled herein or on the plans and as required to meet IEEE 519 requirements.
- C. Unless explicitly noted otherwise, each VFD shall be suitable for use with any standard NEMA-B squirrel-cage induction motor(s) having a 1.15 Service Factor or with existing standard NEMA-B squirrel-cage induction motor(s) -- see schedules.

2.07 COMPONENTS

- A. Display: Provide door-mounted digital display to indicate output voltage, output frequency, and output current.
- B. In addition to electronic operator interface, furnish and install surface mounted components as indicated on the schedule and as indicated on the electrical drawings.
- C. Include undervoltage release.
- D. Control Power Source: Integral control transformer. Transformer shall be oversized as required to power the 0.5 HP auxiliary blower motor in addition to VFD enclosure internal loads.
- E. Door Interlocks: Furnish mechanical means to prevent opening of equipment with power connected, or to disconnect power if door is opened; include means for defeating interlock by qualified persons.

- F. Safety Interlocks: Furnish terminals for remote contact to inhibit starting under both manual and automatic mode.
- G. Disconnecting Means: Include integral circuit breaker on the line side of each controller.
- H. Wiring Terminations: Match conductor materials and sizes indicated.

2.08 6-PULSE COMPONENT DRIVES (1/2 TO 100 HP)

- A. Power Input Options: 400V - 480/3Ø.
- B. Power Output Options: 480/3Ø.
- C. Output wiring from drive to motor: XHHW or XHHW-2 wiring required for all drives at 480 Vac and above except where specific purpose shielded cable is noted on Drawings. See "Low Voltage Electrical Power Conductors and Cables".
- D. VFD size selected for each application shall be based on the motor current as per NFPA 70, Table 430.250 or motor nameplate data, which ever is the greatest.
- E. Load carrying capacity: Continuous at 100% load, 150% for 60s (every 10 min), 180% for 2s (every 10 min).
- F. Output frequency: 0 to 120 Hz minimum.
- G. Output carrier frequency: programmable 5 to 10 kHz.
- H. Standards & Certifications: UL,
- I. Drive interface requirements:
 - 1. VFD shall contain the minimum built-in standard configurations to operate as described herein:
 - a. Drive output to motor shall be selectable to either V/Hz or Sensorless Vector scheme. V/Hz characteristic curve shall be adjustable.
 - b. The drive shall have an integral start/stop device, and speed control knob, such that a power interruption, and subsequent return to power, will cause the drive to restart automatically and ramp up to the speed setting set by the speed control knob, if in fact, it was previously operating at the time of power interruption. If the drive was off at the time of power interruption, it will remain off on return of power.
 - c. The drive shall have the minimum capabilities (via hardwired I/O) for remote start/stop and speed control, such that a power interruption, and subsequent return to power, will cause the drive to restart automatically and ramp up to the speed setting as determined by remote unpowered sources such as momentary start & stop push buttons and a potentiometer, if in fact, it was previously operating at the time of power interruption. If the drive was off at the time of power interruption, it will remain off on return of power.
 - d. The drive shall have all the functions as stated in above items "a & b" plus an intergral remote/local switch, such that a power interruption, and subsequent return to power, will cause the drive to restart in it's previous mode (local or remote) and ramp back up to speed based on the previous setting (local or remote).
 - e. When the drive has a fault, a dry relay contact shall close for remote indication of status and be capable of at least 120Vac at 2A resistive.
 - f. If the drive fails to start, provide configurable parameter for number of retries before setting the "fault" status.
 - g. The drive shall have an embedded PID function and the I/O to provide such functions as remote (and local) start/stop and HOA hardwired switches and speed control based on a process set point.
 - h. The drive shall contain communications interconnection and sufficient I/O whereby the following minimum features can be viewed and controlled via local, remote hardwired and remote communications.
 - i. Communications protocol required: ODVA compliant EtherNet/IP.
 - 2. Minimum Hardwired I/O:
 - a. Analog Input(s): 1 - configurable/programmable unipolar either 0-10Vdc or 4-20mA.

- b. Analog Output(s): 1 - configurable/programmable.
 - c. Digital Input(s): 3 - as sensed by remote dry contacts
 - d. Digital (DC) Output(s): 1 - energize interposing relay.
 - e. Relay Output(s): 4 - dry contact for indication of : Minimum contact rating of switching voltage up to 120Vac and minimum resistive current of 2A.
 - 3. Minimum Operational Programmable Features:
 - a. Current limit: 0 - 200%.
 - b. Overload Class Protection: Class 10.
 - c. Acceleration Time.
 - d. Deceleratin Time.
 - e. All inputs' and outputs' functions and configurations.
 - 4. Operator Interface: at minimum integral one line LCD display with membrane buttons for navigation, start/stop and speed control capable of being mounted remotely from the drive , up to 15', and be capable of uploading the drive's configuration parameters to be downloaded to another.
- J. Ambient Environment
- 1. Operating temperature: 0 to 40°C (32 to 104°F), no frost, non-condensing.
 - 2. Location: Indoors enclosed in an assembly.
 - 3. Required drive enclosure rating: NEMA UL Type 12. NOTE: if a particular manufacturer cannot meet the enclosure rating required, this manufacturer shall provide an enclosure which can meet the requirement, and in addition, provide a cooling system so that the drive can function in the ambient environment specified.
 - 4. Physical Mounting: subpanel mounting within an enclosure.
 - 5. Public Exposure: limited access to unskilled operators.

2.09 VFD INPUT CONDITIONING

- A. Line Reactors (Inductors)
- 1. Designed for specifically for harmonic filtering service.
 - 2. Maximum Operating Temperature: 40 C.
 - 3. Ambient Humidity operating limits: 0 - 95% non-condensing.
 - 4. Impedance: 5%
 - 5. Basic Construction: copper wire wound on magnetic steel core.
 - a. Copper windings shall be wire or foil.
 - b. Core shall be constructed of laminated, grain-oriented, magnetic steel; grade M6 or better.
 - 6. Assembly
 - a. Completed inductors shall be double-impregnated using 100% solid epoxy resin.
 - b. All insulation varnish systems shall be rated Class H, 600V.
 - c. Inductors shall be air-gapped to avoid control point saturation.
 - 7. Quality Assurance
 - a. Inductors shall be Hi-Potential tested (at 2,500 V, 60 Hz) for one minute both all line-to-line and line-to-ground connections.
 - b. UL component-recognized and built to comply with UL508A standards.
 - 8. Acceptable Manufacturers
 - a. Trans-coil Inc. KDR or KLR series.
 - b. Engineer-approved Equal.

2.10 VFD OUTPUT CONDITIONING

- A. Long Motor Lead PWM Output Filter (where indicated on Drawings).
- 1. Designed to reduce voltage spikes (due to high speed switching of IGBTs for PWM operation) by filtering at the source i.e. the VFD drive.
 - 2. Maximum Operating Temperature: 40 C.
 - 3. Ambient Humidity operating limits: 0 - 95% non-condensing.

4. Design Parameters @ guaranteed performance:
 - a. Fundamental maximum frequency: 60 Hz.
 - b. Maximum carrier frequency: 8 kHz.
5. Type of Filter -- Low Pass passive network consisting of:
 - a. Air-gapped iron core inductor with same construction requirements as "Reactors/Inductors" specified in this section.
 - b. AC rated, polypropylene capacitors, 600 Vac.
 - c. Wire-wound resistors -- derated to twice worst case calculated watt loss.
6. Ratings required to match VFD operating requirements.
7. Acceptable Manufacturers
 - a. Sourced or manufactured by same as VFD manufacturer and installed at factory within VFD enclosure.
 - b. Trans-coil Inc. V1k dV/dT series.
 - c. Or Engineer Approved Equivalent.

2.11 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Factory test controllers in accordance with NEMA ICS 61800-2.
- C. Shop inspect and perform standard productions tests for each controller.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that ratings of controllers are consistent with indicated requirements.
- C. Verify that surface is suitable for controller installation.
- D. Verify that conditions are satisfactory for installation prior to starting work.
- E. Do not install controller until building environment can be maintained within the service conditions required by the manufacturer.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install controllers in accordance with NECA 1 (general workmanship).
- C. Install in accordance with NEMA ICS 7.1 and manufacturer's instructions.
- D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- E. Provide required support and attachment in accordance with Section 26 0529.
- F. Install controllers plumb and level.
- G. Provide fuses complying with Section 26 2813 for fusible switches as indicated.
- H. Set field-adjustable settings of controllers and associated components according to installed motor requirements, in accordance with recommendations of manufacturers of controller and load.
- I. Set field-adjustable circuit breaker tripping function settings as indicated.
- J. Tighten accessible connections and mechanical fasteners after placing controller.
- K. Identify variable frequency controllers in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

- A. Provide services of manufacturer's authorized representative to observe installation and assist in inspection and testing. Include manufacturer's reports with submittals.
- B. Provide a manufacturer's certified technician to inspect, prepare before power is applied to each drive.

- C. Perform field inspection and testing in accordance with Section 01 4000.
- D. Perform inspections and tests listed in NETA ATS, Section 7.17. The insulation-resistance test on control wiring listed as optional is not required.
- E. Fusible Switches: Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
- F. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for circuit breakers larger than _____ amperes. Tests listed as optional are not required.
- G. Correct deficiencies and replace damaged or defective controllers or associated components.

3.04 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
- B. Make final adjustments to installed controller to assure proper operation of load system. Obtain performance requirements from installer of driven loads.

3.05 CLEANING

- A. Clean dirt and debris from controller enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

3.06 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate proper operation of controllers to Owner, and correct deficiencies or make adjustments as directed.
- B. Training: Train Owner's personnel on operation, adjustment, and maintenance of controllers and associated devices.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours of training.
 - 3. Instructor: Manufacturer's authorized representative.
 - 4. Location: At project site.
- C. Demonstrate operation of controllers in automatic and manual modes.
- D. Upload all drive parameters and save for Owner's future use.
- E. Training: Provide one trip, one day of 4 hours onsite minimum by manufacturer certified technician.

3.07 PROTECTION

- A. Protect installed controllers from subsequent construction operations.

3.08 MAINTENANCE

- A. Provide trouble call-back service upon notification by Owner:
 - 1. Provide on-site response within 4 hours of notification.
 - 2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
 - 3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
- B. Provide service and maintenance of controllers for one year from Date of Substantial Completion.

END OF SECTION 26 2923

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**SECTION 26 4300
SURGE PROTECTIVE DEVICES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surge protective devices for distribution locations.
- B. Surge protective devices for branch panelboard locations.

1.02 RELATED REQUIREMENTS

- A. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- B. Section 26 2416 - Panelboards.
- C. Section 26 2419 - Motor-Control Centers.

1.03 ABBREVIATIONS AND ACRONYMS

- A. SPD: Surge Protective Device.

1.04 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- C. NETA ATS - Standard For Acceptance Testing Specifications For Electrical Power Equipment And Systems.
- D. NFPA 70 - National Electrical Code.
- E. UL 1449 - Standard for Surge Protective Devices.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate size and location of overcurrent device compatible with the actual surge protective device and location to be installed. Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to ordering equipment.

1.06 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.
- C. Certificates: Manufacturer's documentation of listing for compliance with the following standards:
 - 1. UL 1449.
 - 2. UL 1283 (for Type 2 SPDs).
- D. Operation and Maintenance Data: Include information on status indicators and recommended maintenance procedures and intervals.
- E. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in accordance with manufacturer's written instructions.

1.09 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer's Warranty: Provide minimum five year warranty covering repair or replacement of surge protective devices showing evidence of failure due to defective materials or workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Factory-installed, Internally Mounted Surge Protective Devices:
 - 1. Same as manufacturer of equipment containing surge protective device, to provide complete listed assembly including SPD.
- B. Substitutions: Not Permitted.

2.02 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS

- A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.
- B. Unless otherwise indicated, provide factory-installed, internally-mounted SPDs.
- C. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
- D. Protected Modes:
 - 1. Wye Systems: L-N, L-G, N-G, L-L.
- E. UL 1449 Voltage Protection Ratings (VPRs):
 - 1. 208Y/120V System Voltage: Not more than 700 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
 - 2. 480Y/277V System Voltage: Not more than 1,200 V for L-N, L-G, and N-G modes and 2,000 V for L-L mode.
- F. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.
- G. Enclosure Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
 - 1. Indoor clean, dry locations: Type 1.
- H. Equipment Containing Factory-installed, Internally Mounted SPDs: Listed and labeled as a complete assembly including SPD.
 - 1. Panelboards: See Section 26 2416.
 - 2. Motor Control Centers: See Section 26 2419.

2.03 SURGE PROTECTIVE DEVICES FOR DISTRIBUTION LOCATIONS

- A. Surge Protective Device:
 - 1. Protection Circuits: Non-modular.
 - 2. Surge Current Rating: Not less than 80 kA per mode/160 kA per phase.
 - 3. UL 1449 Nominal Discharge Current (I-n): 20 kA.
 - 4. UL 1449 Short Circuit Current Rating (SCCR): Not less than the short circuit current rating of the equipment the SPD is connected to, including any series ratings.
 - 5. Diagnostics:
 - a. Protection Status Monitoring: Provide indicator lights to report the protection status for each phase.

- b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.
- c. Remote Status Monitoring: Provide Form C dry type contacts (normally open and normally closed) for remote annunciation of status.
- 6. Provide surge rated integral disconnect switch for SPDs not connected to a dedicated circuit breaker or fused switch or not direct bus connected.

2.04 SURGE PROTECTIVE DEVICES FOR BRANCH PANELBOARD LOCATIONS

- A. Surge Protective Device:
 - 1. Protection Circuits: Non-modular.
 - 2. Surge Current Rating: Not less than 25 kA per mode/50 kA per phase.
 - 3. UL 1449 Nominal Discharge Current (I-n): 20 kA.
 - 4. UL 1449 Short Circuit Current Rating (SCCR): Not less than the short circuit current rating of the equipment the SPD is connected to, including any series ratings.
 - 5. Diagnostics:
 - a. Protection Status Monitoring: Provide indicator lights to report the protection status for each phase.
 - b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.
 - c. Remote Status Monitoring: Provide Form C dry type contacts (normally open and normally closed) for remote annunciation of status.
 - 6. Provide surge rated integral disconnect switch for SPDs not connected to a dedicated circuit breaker or fused switch or not direct bus connected.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.
- C. Verify that electrical equipment is ready to accept connection of the SPD and that installed overcurrent device is consistent with requirements of drawings and manufacturer's instructions.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide conductors with minimum ampacity as required by NFPA 70, as required by NFPA 70, and as required by NFPA 70.
- E. Install conductors between SPD and equipment terminations as short and straight as possible, not exceeding manufacturer's recommended maximum conductor length. Breaker locations may be reasonably rearranged in order to provide leads as short and straight as possible. Twist conductors together to reduce inductance.
- F. Disconnect SPD prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPD connected.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Perform inspections and tests listed in NETA ATS Section 7.19.1.

- C. Procure services of a qualified manufacturer's representative to observe installation and assist in inspection, testing, and adjusting. Include manufacturer's reports with field quality control submittals.

3.04 CLEANING

- A. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 26 4300

**SECTION 31 2316.13
TRENCHING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Excavation classification of materials, backfill and bedding materials, excavation for trenches, structures, and appurtenances, sheeting, shoring, and bracing, dewatering, backfill for structures and trenches, utility crossings and standard trench section requirements.

1.02 REFERENCE STANDARDS

- A. [ASTM D698](#) - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- B. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. Iowa Department of Transportation "Standard Specifications for Highway and Bridge Construction," latest edition and current supplements thereto.

1.03 STANDARD DETAILS

- A. Typical detail drawings for trenching, backfilling, and compacting are provided herein or in the Drawings.

1.04 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Compaction Density Test Reports.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Schedule work to avoid property owner inconvenience insofar as practicable during construction.
- B. Existing Utilities:
 - 1. Before starting operations in any area in the vicinity of utility facilities, notify each utility of any operation which may affect their facilities. Provide notice to each utility sufficiently in advance of such operations to allow the utility time to mark the location of, relocate, adjust, or otherwise protect their facilities. Reach an agreement with each utility on appropriate action necessary to protect or relocate the utility facilities. The cost of such action to protect the facilities, except for locates, be borne by the Contractor. Utilize One-Call System (Iowa: 1-800-292-8989), for locates for those utilities which subscribe to this service. Contact all other utilities that do not subscribe to the One-Call System.
 - 2. At all times conduct operation so that necessary clearances are maintained and said utility facilities are protected. Comply with all Local, State, and Federal, or other regulations in performing work near utility facilities.
 - 3. Should the Contractor damage any of the utility facilities during Contractor's operations or determine the work cannot be performed safely. Immediately notify the utility involved and cease work until arrangements are made to prevent further damage or a serious accident.
 - 4. Failure of the Contractor to provide timely notice to the utility or to conduct operations in such a manner that proper clearances are maintained and the utility facilities are protected at all times will be grounds for the issuance of a Stop Work Order.
 - 5. Notify Engineer of unexpected subsurface conditions and discontinue Work in area until Engineer provides notification to resume work.
- C. When necessary, store materials on site in advance of need.
- D. Verify that survey bench marks and intended elevations for the Work are as indicated.
- E. Protect bench marks, survey control points, existing structures, and paving from excavating equipment and vehicular traffic.

- F. Remove, replace and repair fences, signs and other obstructions as necessary for construction; return all items to equal or better than original condition.
- G. Restore obstructions removed to accommodate construction equipment or to facilitate excavation.
- H. Contractor responsible for providing adequate barricades and protection around excavation and work areas.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. See Section 31 2323 - Fill.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey bench marks and intended elevations for the work are as indicated.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Locate, identify, and protect utilities that remain and protect from damage.
- C. Notify utility company to remove and relocate utilities.
- D. Protect plants, lawns, rock outcroppings, signs, and other features to remain.
- E. Grade top perimeter of trenching area to prevent surface water from draining into trench. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by the Engineer.

3.03 TRENCHING

- A. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- B. Trench Bottom:
 - 1. Provide firm, stable and uniform support for full length of pipe.
 - 2. With acceptable soils, lay pipe on layer of loose material after leveling trench bottom. If no loose material remains, shave soft material from trench walls and compact or use granular bedding.
 - 3. If trench bottom is rocky or hard, over-excavate trench and place select or granular backfill below pipe as pipe cushion material. Cushion material shall be the same as the specified bedding material.
 - 4. When unstable material is encountered which may not provide a suitable foundation for pipe, remove unsuitable material and replace with stabilizing material.
- C. Keep sides of trench as nearly vertical as practicable within the limits of excavation codes and safety requirements; maintain vertical walls of excavation below top of pipe. Provide trench wall support as needed.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Excavate to full depth by machine; level trench bottom to provide uniform bearing and support for full length of pipe.
- F. Provide bell holes at each pipe joint; allow access completely around circumference of pipe for proper jointing operations.
- G. Conform to best trench bottom construction practices as recommended by pipe manufacturer.
- H. Trench bottoms carried below required grade; backfill to proper elevation with granular bedding at no expense to the Owner.
- I. When unstable material is encountered which may not provide a suitable foundation for pipe
 - 1. Notify Engineer immediately.

2. Engineer will investigate questionable material to determine its suitability for pipe foundation.
3. If material is considered unsuitable for pipe foundations, Engineer will specify and authorize remedial measures in writing.
4. If removal of unsuitable material is authorized:
 - a. Replace with trench stabilizing material.
 - b. Provide minimum of 4 inch of bedding material on top of stabilizing material to prevent point load. Bedding material graded sufficiently coarse to prevent movement and loss of bedding into trench stabilizing material.
- J. Cut trenches wide enough to allow inspection of installed utilities. Maximum trench width shall be pipe O.D. plus 24". Provide cradling or strengthening at Contractor's expense if maximum trench width is exceeded.
- K. When the material being excavated is such that it is physically impossible to stabilize the trench bottom or secure a uniform bearing using dewatering and stabilizing material and in the judgement of the Engineer concrete encasement, concrete cradling or pilings are necessary to support the pipe, provide such support when directed in writing by the Engineer. If not shown on Drawings, cradling, encasing, and pilings, if necessitated by native trench conditions and not the Contractor's operations, shall be paid for as extra work.
- L. Hand trim excavations:
 1. Under and around utilities.
 2. Where overhead clearance prevents use of machine.
- M. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.
- N. Remove excavated material that is unsuitable for backfill from site. Waste at disposal area obtained by the Contractor at no cost to the Owner.
- O. Stockpile excavated material suitable for backfill in an orderly manner a sufficient distance from edge of excavation to avoid rollbacks, slides, or cave-ins. Stockpile topsoil .
- P. Remove excess excavated material from site.
- Q. Provide temporary means and methods, as required, to remove all water from trenching until directed by the Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.
- R. Determine the prevailing groundwater level prior to trenching. If the proposed trench extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Engineer.
- S. Remove brush, rubbish, spoil and material not suitable for backfill; waste at off-site disposal area obtained by the Contractor at no cost to the Owner.
 1. Remove waste material promptly as it is generated by construction operations; do not permit it to accumulate.
 2. Grade disposal areas periodically to reasonable neat surface to provide for drainage and access by others.

3.04 PREPARATION FOR UTILITY PLACEMENT

- A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.05 BACKFILLING

- A. Employ a placement method that does not disturb or damage other work.
- B. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- C. Maintain optimum moisture content of fill materials to attain required compaction density.

- D. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- E. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
- F. Correct areas that are over-excavated.
 - 1. Thrust bearing surfaces: Fill with concrete.
 - 2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density at minus 2 percent to 4 percent of optimum moisture.
- G. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. Under paving and similar construction: 97 percent of maximum dry density.
 - 2. At other locations: 95 percent of maximum dry density at minus 2 percent to 4 percent of optimum moisture.
 - 3. See Section 31 2323 - Fill for additional requirements.
- H. Reshape and re-compact fills subjected to vehicular traffic.

3.06 DEWATERING

- A. Do all work in dry conditions; obtain Engineer's approval of proposed methods of dewatering.
- B. Provide for handling water encountered during construction.
 - 1. Divert stream flow and sewage away from areas of construction.
 - 2. Prevent surface water from flowing into excavation; remove water as it accumulates.
 - 3. If groundwater is encountered, provide sumps in the trench or some other methods for removal of water and stabilization of trench bottom.
 - 4. Do not pump water to existing sanitary sewers or onto adjacent property without approval of the Engineer and adjacent property owner.
- C. Lay no pipe in, and place no concrete on, excessively wet soil.
- D. Protect against settlement or damage to adjacent property.

3.07 EXISTING UTILITY CROSSINGS

- A. Notify utility companies before excavating; utilize Iowa Utility One-Call (800-292-8989); conform to current utility notification requirements.
- B. Where new construction crosses or closely parallels existing utilities or utility services, excavate in advance of pipe laying to determine location and crossing arrangement, including exact construction line and grade.
- C. Utility mains shown on Drawings in conflict with new facilities: Perform relocation or make arrangements with utility to perform Work.
- D. Utility mains not shown on Drawings in conflict with new facility: Notify Engineer immediately.
- E. Provide compacted sand or granular material under all existing utilities or service lines that are located above the new pipeline. Compact material to a minimum of 95% maximum dry density.

3.08 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Perform compaction density testing uniformly throughout the placing of the compacted fill in accordance with ASTM D2922 and ASTM D698 to maintain quality control at all times.
- C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.
- D. Frequency of Tests: One field density and moisture test per lift per 400 SY of trench under paved and/or unpaved areas. Minimum one test per lift.

3.09 CLEANING

- A. Clean up each portion of construction as it is completed.
 - 1. Restore obstructions removed to accommodate construction equipment or to facilitate excavation.
 - 2. Clean up and remove rubbish, debris, and surplus materials.
- B. Reopen to traffic as soon as practicable.
- C. Unused materials shall be in a neat, compact stockpile until removal.
- D. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- E. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION 31 2316.13

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SECTION 31 2323
FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Backfill and bedding materials, excavation for trenches, structures, and appurtenances, sheeting, shoring, and bracing, backfill for trenches.

1.02 RELATED REQUIREMENTS

- A. Section 31 2316.13 - Trenching: Excavating for utility trenches outside the building ____.

1.03 REFERENCE STANDARDS

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- C. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- D. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
- E. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- F. ASTM D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.
- G. ASTM D4491 - Standard Test Method for Water Permeability of Geotextiles by Permittivity.
- H. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- I. ASTM D4759 - Standard Practice for Determining the Specification Conformance of Geosynthetics.
- J. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- K. Iowa Department of Transportation, "Standard Specification for Highway and Bridge Construction," latest edition and current supplements thereto.

1.04 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS, for submittal procedures.
- B. Materials Sources: Submit name of imported materials source.
- C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill.
- D. Compaction Density Test Reports.

1.05 QUALITY ASSURANCE

- A. The Owner shall employ and pay for services of the independent testing laboratory for tests required to show compliance with the specifications. Contractor shall coordinate testing as required with testing agency. Contractor shall notify Engineer prior to scheduled test events.
- B. Determine moisture density relations of soils encountered during construction in accordance with standard proctor method. Provide graph of proctor soil density versus water content for all backfill material.
- C. Provide gradation and materials tests for pipe bedding and stabilizing material.
- D. Test trench backfill soil density and moisture at one test per lift per 400 SY of trench under paved and/or unpaved areas.

- E. Reference to percent maximum density shall mean a soil density not less than the stated percentage of maximum density for soil as determined by ASTM D698, "Moisture Density Relations of Soils" Standard Proctor Method.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where designated by Owner.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.
 - 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey bench marks and intended elevations for the Work are as indicated on Drawings.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. General Fill material under paved areas: Use Subsoil excavated on-site or from off-site borrow area. General fill material to be free of foreign substance, debris, large stones, rocks, roots, organic or frozen material, expansive material and other deleterious materials.
 - 1. Free of lumps larger than 4 inches, rocks larger than 4 inches, and debris.
 - 2. Liquid limit less than 45 and plasticity index less than 22.
- B. Select Backfill: Select backfill and bedding for pipes and structures shall be approved select material obtained from site or from off-site borrow areas. Material to be free of foreign substance, debris, large stones, rocks 1-1/2" or larger, roots, organic or frozen material, expansive material and other deleterious materials. See details on Drawings and/or Typical Detail Drawings herein for typical extent of select bedding and backfill.
 - 1. Select Backfill to be compacted to 95% Proctor Density or as stated in drawings.
- C. Granular Fill - Gravel : Pit run washed stone; free of shale, clay, friable material and debris.
 - 1. Graded in accordance with ASTM C136/C136M, within the following limits:
 - a. 2 inch sieve: 100 percent passing.
 - b. 1 inch sieve: 95 percent passing.
- D. Topsoil: Topsoil excavated on-site.
 - 1. Free of roots, rocks larger than [1] inch, subsoil, debris, large weeds, clay and impurities, plants and foreign matter.
- E. Initial Backfill - See C.500 Series Trench Details
 - 1. Pressure Lines
 - a. Select fill per specifications
 - 2. Parallel Piping
 - a. Refer to applicable use and material specifications as stated above.

2.02 ACCESSORIES

- A. Filter Fabric: Manufacturer's standard non-woven pervious geotextile fabric of polypropylene, nylon or polyester fibers, or a combination.
 - 1. Provide filter fabrics that meet or exceed the listed minimum physical properties determined according to ASTM D4759 and the referenced standard test methods in parenthesis:
 - a. Grab Tensile Strength (ASTM D4632): 100 pounds.
 - b. Apparent Opening Size (ASTM D4751): #100 U.S. Standard Sieve.
 - c. Permeability (ASTM D 4491): 150 Gallons per minute per square foot.

2.03 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.

- B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- C. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- C. Verify structural ability of unsupported walls to support imposed loads by the fill.
- D. Verify areas to be filled are not compromised with surface or ground water.

3.02 PREPARATION

- A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 BEDDING AND BACKFILL FOR TRENCHES

- A. Place bedding from bottom of pipe trench to pipe spring line as indicated on applicable Typical Detail Drawings. Bedding includes material below bottom of pipe as specified. Compact bedding below bottom of pipe prior to installation of pipe to minimize settlement.
- B. Use caution when placing and compacting backfill to avoid placing construction loads on pipe which may damage or displace newly laid pipe.
- C. Bedding for Pressure Lines:
 - 1. Native select material as specified or granular pipe bedding material.
 - 2. Shape bedding to accommodate pipe bell.
 - 3. Compact bedding and cushioning materials in 6" (150 mm) lifts from trench bottom to bottom of pipe.
 - 4. Compact backfill material to a minimum 95 percent Standard Proctor density (ASTM D698).
 - 5. Construct structures and appurtenances and perform backfilling as work progresses.
- D. Construct manholes and appurtenances and perform backfilling as work progresses.
- E. Backfill with material removed from excavation except where imported backfill is specified; use no debris, frozen earth, large clods, stones, or other unsuitable material. If native material is too wet or dry to achieve specified compaction, Contractor required to dry or wet material or replace with approved imported material at no additional cost to the Owner.
- F. Percent maximum density shall mean a soil density no less than the stated percent of optimum density for soil as determined by ASTM D698, Standard Proctor Density or ASTM D1557, Modified Proctor Density.
- G. Rocks 4 inches in diameter and larger, wood, frozen earth, clods of earth and/or hard, bulky materials shall be considered as spoil materials and shall not be used as selected material for bedding, initial and trench backfill. Dispose of spoil material by hauling materials to a suitable disposal site obtained by the Contractor.
- H. Backfill simultaneously on both sides of pipe to prevent displacement.
- I. Place backfill into trench at an angle to minimize impact on installed pipe.
- J. Initial Backfill:
 - 1. As previously specified.
- K. Backfill trench immediately after location of connections and appurtenances have been recorded. Conform to applicable Typical Detail Drawings contained herein.

- L. Placement of Backfill:
 - 1. Place initial backfill material only after installation of pipe and bedding material has been completed.
 - 2. Place all initial backfill in such a manner so not to damage or displace pipe.
 - 3. Compact to minimize settlement of trench backfill and provide optimum support of pipe.
- M. Place trench backfill only after initial backfill has been placed, compacted, and approved. Trench backfill, material and compaction requirements depend on what area the pipe is located beneath as specified. Trench backfill begins 1'-0" (1/3 m) above pipe barrel and terminates at final grade or subgrade.
- N. Trench Backfill:
 - 1. Select material compacted in 8" (150 mm) lifts with pneumatic or mechanical tampers to finish grade or subgrade. Compact to a minimum of 95% Standard Proctor Density (ASTM D698).

3.04 FILLING

- A. Backfill voids resulting from demolition and excavation to obtain grade required around structures.
- B. Fill to contours and elevations indicated using unfrozen materials.
- C. Employ a placement method that does not disturb or damage other work.
- D. Backfilling around structures:
 - 1. Prevent displacement of structural components during backfilling operations. Backfill opposite sides simultaneously with a maximum backfill elevation difference of 6 feet.
 - 2. For walls that are unbraced at the top edge, backfill can be place upon concrete reaching required strength, as noted above.
 - 3. For walls that are braced at the top edge, backfill can be placed only when the next level floor framing or cover slabs are in place and the concrete has reached the required strength, as noted above.
- E. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- F. Maintain optimum moisture content of fill materials to attain required compaction density.
- G. Placement:
 - 1. Maintain surfaces free of water, debris, and excessively wet, frozen , and other deleterious materials.
 - 2. Place and compact backfill materials in loose lifts not exceeding 9 inches in thickness
- H. Granular Fill: Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.
- I. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
- J. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- K. Correct areas that are over-excavated.
 - 1. Use granular fill____, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
- L. Compaction Density Unless Otherwise Specified or Indicated:
 - 1. 95 percent of maximum dry density.
 - 2. Obtain required compaction within a soil moisture range of optimum moisture to 4% above optimum moisture content.
- M. Reshape and re-compact fills subjected to vehicular traffic.
- N. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

- O. Pneumatic tired rollers or heavy vibratory compactors shall not be used within 6 ft. (2 m) of structure, walls, pipes, or other construction which might be damaged by compaction equipment.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.
- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with AASHTO T 180, ASTM D 1557 ("modified Proctor"), ASTM D 698 ("standard Proctor"), AASHTO T 180, ASTM D 1557 ("modified Proctor"), ASTM D 698 ("standard Proctor"), AASHTO T 180, ASTM D 1557 ("modified Proctor"), or ASTM D 698 ("standard Proctor").
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Frequency of Tests:
 - 1. Take soil density tests uniformly throughout the placing of fill material so that quality control can be maintained at all times. Minimum requirements are as follows:
 - a. One field test per day for each type of fill on any day when fill is placed, regardless of quantity.

3.06 CLEANING

- A. Clean up each portion of construction as it is completed.
- B. Remove unused stockpiled materials, rubbish, and debris and leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

END OF SECTION 31 2323

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**SECTION 32 1623
SIDEWALKS AND DRIVEWAYS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete sidewalks.
- B. Concrete driveways.

1.02 REFERENCE STANDARDS

- A. ACI PRC-305 - Guide to Hot Weather Concreting.
- B. ACI PRC-306 - Guide to Cold Weather Concreting.
- C. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.

1.03 IOWA DOT REFERENCE

- A. Iowa Department of Transportation "Standard Specifications for Highway and Bridge Construction," latest edition and current supplements thereto.

1.04 SUBMITTALS

- A. See Section 01 3000 - ADMINISTRATIVE REQUIREMENTS for submittal procedures.
- B. Product Data:
 - 1. Concrete: Provide data on admixtures.
- C. Provide concrete mix design report and details of joint type and locations on pavement before placing concrete.
- D. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

1.05 FIELD CONDITIONS

- A. Follow recommendations of ACI PRC-305 and ACI PRC-306 when concreting during hot and cold weather, respectively.

PART 2 PRODUCTS

2.01 CONCRETE SIDEWALKS AND DRIVEWAYS

- A. Modified Subbase: Thickness as indicated on drawings.
 - 1. Comply with Iowa DOT Specifications Section 4123.
- B. Concrete Forms: Wood.
- C. Concrete Materials:
 - 1. Portland Cement: ASTM C150, Type 1.
 - 2. Concrete shall be in accordance with IDOT Section 2301, Mix C-4, Class 3 durability.
 - a. 0.5 inch to 4 inch slump.
 - b. 6.5 percent, plus or minus 1.5 percent, air entrainment
- D. Aggregate: Pit Run, washed, 3/8 inch (1 cm) stone; free of shale, clay, friable material and debris.
- E. Aggregate:
 - 1. Fine aggregate: Iowa DOT 4110.
 - 2. Course aggregate:
 - a. Clean, hard, durable particles of crushed limestone free from injurious amounts of objectionable materials; minimum Class 2 durability limestone; Iowa DOT 4115.
 - b. Gradation: Iowa DOT 4115, Gradation Number 5.
- F. Air-Entraining Admixtures: ASTM C260/C260M.
 - 1. Retarding: A suitable retarding admixture may be used during hot weather, with approval of Engineer.
 - 2. Calcium chloride shall not be used.

3. Water Reducing Agents: ASTM C 494; Iowa DOT IM 529.
 4. Other admixtures may be used subject to approval of Engineer.
- G. Accessories
1. Expansion tubes: Fabricated steel or plastic tubes; provide tubes with internal diameter 1/16" larger than dowel bar; bar stop capable of withstanding 20 lbs. push, minimum.
 2. Metal keyways: Fabricated 24 gauge sheet steel; conform to details shown on Drawings; provide lengths in multiples of tie bar spacing; punch to receive tie bars; support metal keyway with legs unless installed by paving machine.
 3. Liquid curing compounds: Use white curing compounds on all pavements.
- H. Joints:
1. Joint Sealer: Hot poured joint filler composed of petropolymers, ASTM D 3405 with 90-150 penetration at 77°F. and passing 3 cycles, 200% extension bond test at – 20°F for all regular concrete.
 2. Backer Rope: Cellulose or plastic foam suitable for use with hot-poured sealer; size and compression such that it maintains position during filling operation.
 3. Preformed Expansion Joint Filler: Asphalt saturated fiber strips; AASHTO M213; furnish in strips of plan dimensions.
- I. Plastic film: Opaque, white pigmented polyethylene plastic, 0.00085" minimum thickness, use only once if less than 0.0034" thick.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify gradients and elevations of the subgrade are correct as shown on drawings. Where poor subgrade material is encountered, remove and replace with suitable material.
- B. Verify compacted subgrade is acceptable, ready to support imposed loads and paving, and ready to receive work.

3.02 SUBGRADE PREPARATION

- A. Uniform Composition: Provide uniform composition of at least 12 inches below top of subgrade under new paving or subbase, plus 2 feet on each side. Use select subgrade materials unless granular stabilization materials or subgrade treatment is specified.
- B. Subgrade Compaction in Fill Sections:
1. Follow the compaction with moisture and density control requirements in Section 2010, 3.04.
 2. Construct in two 6 inch lifts.
- C. Subgrade Compaction in Cut Sections:
1. Excavate and stockpile the top 6 inches of subgrade.
 2. Scarify, mix, and re-compact the next 6 inches of subgrade.
 3. Replace, mix, and compact the top 6 inches of subgrade.
 4. Moisture Content and Density:
 - a. Ensure that moisture content falls within a range of optimum moisture to 4% above optimum moisture.
 - b. Compact cohesive soils to no less than 95% of maximum Standard Proctor Density; and cohesionless soils to no less than 70% of Relative Density.
- D. Final Subgrade: Complete final subgrade by excavation to grade by use of steel-shod template supported on side forms, support rollers, or by use of an automatically-controlled subgrade excavating machine.
- E. Subgrade Check: Check subgrade elevation and grade by method approved by Engineer prior to paving.
- F. Ruts: If ruts or other objectionable irregularities form in subgrade during construction, re-shape and re-roll subgrade before placing pavement. Fill ruts or other depressions with material similar to other subgrade material, and compact.

3.03 SUBBASE INSTALLATION

- A. Place aggregate in maximum 4 inch layers and roller compact to specified density.
- B. Level and contour surfaces to elevations and gradients indicated.
- C. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.
- D. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.
- F. Maintain subgrade in a smooth, compacted condition with required section and established grade until concrete is placed.

3.04 CONCRETE SIDEWALK AND DRIVEWAY INSTALLATION

- A. Forming:
 - 1. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
 - 2. Forms: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Height equal to the full depth of the finished sidewalk/driveway.
 - 3. Measure or stake as required to construct project elements. Verify that form work complies with the design requirements:
 - a. The tolerance between the design running slope and the maximum allowable running slope is less than 1.0%.
 - b. The tolerance between the design cross slope of the sidewalk, turning space, or shared use path and the maximum allowable cross slope is less than 0.5%.
- B. Placement:
 - 1. Uniformly moisten subgrade just prior to concrete placement.
 - 2. Adjust manhole castings, valve boxes, or other fixtures within pavement to finished surface grade; clean outside of castings.
 - 3. Place concrete to full depth in single operation; do not pile concrete more than 8" above design elevation of surface.
 - 4. Carefully place concrete on subgrade to prevent segregation of materials and at locations which require minimum rehandling; do not displace reinforcing.
 - 5. Vibrate and consolidate to prevent formation of voids
- C. Joints:
 - 1. Construction joint:
 - a. Locate construction joints with keyway to provide uniform joint spacing.
 - b. Place a construction joint at the close of each day's work or when depositing of concrete is stopped for 45 minutes or more.
 - c. Form construction joint by using a header board. Set perpendicular to the surface and at right angles to the centerline.
 - 2. Contraction joint:
 - a. Space sidewalk contraction joints equal to the width of the sidewalk.
 - b. Space driveway contraction joints so panel length does not exceed 12 feet.
 - c. Form transverse contraction joints to a depth of 1 1/4 inches with a pointed trowel or jointing tool. In lieu of forming, joints may be sawed within 12 hours of placement with a 3/16 inch blade saw to a depth of 1/3 the pavement thickness. Use a straightedge if joints are sawed with a hand-held saw.
 - 3. Isolation joint:
 - a. Install isolation joints where sidewalks or driveways abut roadway pavement, parking lots, buildings, and structures.
 - b. Install a 1/2 inch or 3/4 inch thick strip of preformed resilient joint material to the full depth of concrete. Trim any isolation joint material protruding above the finished work to the level of the abutting concrete.

- c. If the isolation joint is to be sealed, place the preformed material 1/2 inch below the level of the abutting concrete.
- D. Finishing:
 - 1. Use a wood float to depress the large aggregate and create a dense surface.
 - 2. Allow concrete to set until all shine has disappeared from the surface.
 - 3. Smooth with a metal trowel until surface is free from defects and blemishes.
 - 4. Construct joints by sawing or by using a jointer or groover tool.
 - 5. Finish edges of sidewalk or driveway with an edging tool having a radius of approximately 1/2 inch. Ensure tool marks do not appear on the finished surface.
 - 6. Brush with a soft broom at right angles to the side forms to provide a non-skid surface.

3.05 PROTECTION

- A. Immediately after placement, protect sidewalk from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over sidewalk for 7 days minimum after finishing.

3.06 DEFECTS OR DEFICIENCIES

- A. Pavement containing excessive cracks, fractures, spalls, or other defects shall be removed and replaced, or repaired, at no cost to Owner. Severity of defects and remedy, determined by Engineer.

END OF SECTION 32 1623

**SECTION 32 9219
SEEDING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Placing topsoil.
- B. Seeding, mulching and fertilizer.
- C. Maintenance.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Source Quality Control: Manufacturer's test for purity and germination of seed, dated within six months of seeding.
- C. Certificate: Manufacturer's certification that materials meet specifications.
- D. Maintenance Contract.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 6000.
- B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 PRODUCTS

2.01 SEED MIXTURE

- A. Urban Seed Mixture:
 - 1. Seed mixture in accordance with requirements of Section 26 01.04(c) of Iowa DOT Specifications.
 - 2. Kentucky Blue Grass: 70% (Based on 4 lbs. per 1000 sq. ft.).
 - 3. Creeping Red Fescue Grass: 20% (Based on 4 lbs. per 1000 sq. ft.).
 - 4. Norlea Perennial Rye: 10% (Based on 4 lbs. per 1000 sq. ft.).

2.02 SOIL MATERIALS

- A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds roots; rocks larger than 1"; pH value of minimum 5.4 and maximum 7.0.

2.03 ACCESSORIES

- A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
- B. Fertilizer:
 - 1. All areas to be seeded should be fertilized
 - 2. Commercial product to be applied at a rate of not less than 50 pounds per acre
 - 3. Ratio of available nutrients (Nitrogen/Phosphorous/Potassium) shall be 10-6-4. The fertilizer should be uniformly and evenly applied to the areas worked into the soil during seed bed preparation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 GRADING

- A. Erosion and Drainage: The Contractor shall be responsible for incidental grading on site to eliminate erosion gullies and ruts, and shall provide proper cross section for drainage as directed by Engineer.
- B. Fill Material: If extra earthwork fill is needed, provide fill to conform to lines and grades as shown on the plans.

3.03 PREPARATION

- A. Areas Accessible to Machinery: Thoroughly work areas accessible to field machinery to a depth of not less than three inches (3"). Soil brought to a loose, friable condition, and picked free of rocks and concrete chunks in excess of one inch (1") diameter where weed growth has developed extensively. Use of a disk allowed to disk these weeds into the ground if the weeds can be completely covered by this method.
- B. Areas Inaccessible to Machinery: Prepare areas inaccessible to field machinery by hand to a depth of not less than one and one-half inches (1-1/2"). The soil shall be brought to a loose friable condition.
- C. The seed bed shall be inspected and approved by the Engineer prior to seeding.

3.04 PERFORMANCE

- A. Seed, fertilize, and mulch topsoiled areas and areas disturbed by construction, including areas outside of construction limits and slope intercepts.

3.05 FERTILIZING

- A. Fertilize all areas to be seeded.
- B. Broadcast fertilizer over seeded area after germination of seed but prior to emergence of three to five leaves per plant.
- C. Mix thoroughly into upper 2 inches of topsoil.
- D. Lightly water to aid the dissipation of fertilizer.

3.06 SEEDING

- A. Apply
 - 1. Seeding and re-seeding to take place between September 1 and November 30; & March 15 until May 31
 - 2. Rework previously prepared areas that have become compacted or damaged by rains
 - 3. Do not drill or sow during windy weater, when ground is frozen or un-tillable, immediately following rain, or when ground is too dry.
- B. Guarantee: If less than fifty percent (50%) of seed fails to become established and survive to the next season in any given area three (3) square feet or larger, the Contractor shall be responsible for preparing the seed bed and reseeding as specified in Section 32 9219.
- C. Cover seed depth between 1/4 to 1/2 inch by raking or harrowing.
- D. Firm seeded areas with roller weighing maximum of 100 pounds per foot to width.
- E. Do not use seed which has become wet, moldy, or otherwise damaged in transit or storage.
- F. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.07 SCHEDULE

- A. Urban area seeding of all grassed areas disturbed by the Contractor's operations.

3.08 MULCHING

- A. Mulch all seeded areas as soon as seed is applied.

3.09 MAINTENANCE

- A. Provide maintenance at no extra cost to Owner; Owner will pay for water.
- B. See Section 01 7000 - Execution Requirements, for additional requirements relating to maintenance service.
- C. Provide a separate maintenance contract for specified maintenance service.
- D. Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.
- E. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
- F. Neatly trim edges and hand clip where necessary.
- G. Immediately remove clippings after mowing and trimming.
- H. Water and maintain areas until 2" catch of grass is obtained.
- I. Roll surface to remove minor depressions or irregularities.
- J. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
- K. Immediately reseed and mulch areas which show bare spots at no additional cost to Owner.
- L. Protect seeded areas with warning signs during maintenance period.

END OF SECTION 32 9219

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**SECTION 33 0513
MANHOLES AND STRUCTURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cast-in-place concrete or precast concrete manhole sections and vaults with tongue-and-groove joints with covers, anchorage and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM C1634 - Standard Specification for Concrete Facing Brick.
- B. ASTM A48-83 - Standard Specification for Gray Iron Castings (Class 35).
- C. ASTM A58-83 - Ductile Iron Castings (Grade 65-45-12).
- D. ASTM C139-73 - Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
- E. ASTM C270-89 - Standard Specification for Mortar for Unit.
- F. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
- G. ASTM C478M - Standard Specification for Precast Reinforced Concrete Manhole Sections.
- H. ASTM C497 - Absorption and Concrete Compression Tests.
- I. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
- J. ASTM C923M - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
- K. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
- L. ASTM D4976 - Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. If manufacturer's test data is inadequate or unavailable, Engineer reserves the right to require cores drilled for compressive strength tests.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Shop Drawings: Indicate manhole locations, elevations, piping sizes, elevations of penetrations, and adjusting ring dimensions.
- E. Product Data: Provide data indicating castings and precast products, manhole covers, component construction, features, configuration, and dimensions.
- F. Project Record Documents:
 - 1. Record location of manholes, connections, and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.04 QUALITY ASSURANCE

- A. Contractor shall employ and pay for services of the independent testing laboratory for tests required to show compliance with the specifications. Test results shall be submitted directly to Owner/Engineer. Selection of the testing laboratory is subject to approval of Owner/Engineer.
- B. Certify that manholes are manufactured in accordance with applicable specifications. Provide copies of concrete cylinder compression tests made during manufacture of precast materials.
- C. Provide Iowa Professional Engineer Certification of structure with shop drawing submittal.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products under provisions of Section 01 6000.
- B. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- C. Coordinate deliveries to avoid conflict with conditions at site.
- D. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- E. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- F. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- G. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- H. Arrange storage in a manner to provide easy access for inspection.
- I. Maintain storage conditions to prevent deterioration or damage.
- J. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- K. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- L. Handle products by methods to prevent bending or overstressing.

PART 2 PRODUCTS

2.01 SANITARY MANHOLES

- A. Standard manholes shall consist of precast or cast-in-place base, precast top, precast riser sections, steps, sealant, manhole frame and lid.
- B. Manhole Riser Sections: Reinforced precast concrete in accordance with ASTM C478 (ASTM C478M)
- C. Manhole Base: Precast concrete manhole bottom section and base, or cast in place concrete, if approved by the Engineer.
 - 1. Precast concrete bases shall be reinforced as shown on Contract Drawings.
- D. Manhole Top Slab: Precast Concrete
 - 1. Precast top slab shall be reinforced as shown on Contract Drawings.
 - 2. Valve extension stem shall be cast in the slab with a floor box. A wrench nut shall be attached to the top of the extension stem and level with the top slab surface. Refer to Contract Drawings for details.
- E. Concrete Sections: Manhole barrel, base, and special precast sections shall conform to ASTM C478. Base sections shall be cast integrally with the bottom manhole section, unless the manhole is constructed over an existing line or other constraints require block or separate slab/barrel construction. Concrete shall be air-entrained, 5 to 7 percent.
- F. Joints:
 - 1. Joints between concrete sections shall be confined "O" ring conforming to ASTM C361 and C443, and shall be Cretex CX2.
 - 2. All joints shall be wrapped with WrapidSeal manhole encapsulation system (or approved equal).
- G. Sealant:
 - 1. Sonneborn Hydrocide 700B emulsified asphalt damp-proofing compound or approved equal.
 - 2. Apply to Manhole Exterior per manufacturers recommendations for exterior surfaces below grade - dense surfaces, 2 coats applied by brush or spray.

- H. Castings:
 - 1. ASTM A 48 CLASS 30.
 - 2. Cast iron covers and frames shall be heavy traffic type, diameter as noted, to meet requirements of the city or the local utility company.
 - 3. Manhole frame and covers shall be double lid frost-proof design.
 - 4. Cover: Removable, boltable; closed cover design; cover molded with SANITARY SEWER name.
 - 5. Castings shall be bolted to the top slab.
 - 6. Manufacturers:
 - a. Old Castle Precast
 - b. Linsay Precast
 - c. Engineer Approved Equivalent
- I. Pipe connections:
 - 1. Where pipe enters a new precast manhole:
 - a. Watertight flexible connection meeting requirements of ASTM C923 shall be used.
 - b. Connection cast in the base.
 - c. Minimum clear opening of 24" or 36" as shown on Drawings.
 - d. A-LOK flexible connection or Engineer approved equivalent.
 - 1) Connection to allow differential settlement of pipe and manhole without leakage.
- J. Steps:
 - 1. As detailed in Drawings.
- K. Granular Materials: Furnished for foundation, bedding, encasement, backfill, or other purposes as may be specified. Consists of any natural or synthetic mineral aggregate such as sand, gravel, crushed rock, crushed stone, or slag that shall be so graded as to meet the gradation requirements specified in Section 31 2323 or as noted in the Contract Drawings.
- L. Concrete fillet: See C and S drawings for requirements.

2.02 CONFIGURATION

- A. Shape: As indicated on Contract Drawings.
- B. Clear Inside Dimensions: As indicated on Contract Drawings.
- C. Design Depth: As indicated on Contract Drawings.
- D. Clear Lid Opening: As indicated on Contract Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify excavation for manholes is correct.
- B. Verify that field measurements and elevations are as indicated.
- C. Verify that pit cut and excavation base are ready to receive work and excavations, dimensions and elevations are as indicated on Drawings.

3.02 MANHOLES

- A. Place concrete base pad, trowel top surface level.
- B. Cut and fit for pipe.
- C. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.
- D. Manholes, catch basins and other special access structures shall be constructed as designated locations as required by the plans and in accordance with the detail plates.
- E. Place concrete base pad on a minimum of 12" of compacted crushed rock.

- F. When placing the precast base, the bedding shall be solid and compacted to the grade necessary prior to setting the base. Manipulation of the base to achieve the proper grade will not be allowed. If the base is low and needs fill to level it or is high and material must be removed, the base shall be removed, bedding corrected, and the base reset to proper grade.
- G. Only one precast manhole riser section shall be placed upon new poured-in-place concrete bases until the concrete has reached 50% of its design strength.
- H. When exact location of existing sewers to be intercepted is not known, field adjustments may be necessary to meet the conditions found. Such adjustments shall not entitle the Contractor to any claim for extra work.
- I. Place manhole sections plumb and level.
- J. Set cover frames and covers level without tipping, to correct elevations.
- K. Coordinate with other sections of work to provide correct size, shape, and location.

3.03 RESTRICTIONS ON OPERATIONS

- A. Do not place concrete when stormy or inclement weather or temperature prevents good workmanship.
- B. Use no aggregates containing frozen lumps and do not place concrete on frozen foundation.
- C. With weather conditions, begin concrete mixing and placement when ambient temperature is at least 34 degrees Fahrenheit and rising.
- D. Concrete delivered to site must have temperature of at least 40 degrees Fahrenheit.
- E. Stop concrete mixing and placement when ambient temperature is 38 degrees Fahrenheit and falling.
- F. Stop concrete mixing and placement when ambient temperature exceeds 95 degrees Fahrenheit.

3.04 FIELD QUALITY CONTROL

- A. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no cost to the Owner.

3.05 TESTING

- A. Manhole Infiltration (Vacuum) Test
 - 1. Testing of manholes and structures shall be accomplished by means of a vacuum test in accordance with ASTM C1244-93 "Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test."
 - 2. The vacuum test shall include testing the top of the manhole, excluding the adjusting rings and manhole frame and cover. Testing will be allowed after backfilling has occurred. Repair of leaks may require the removal and replacement of manhole sections. The use of grout to repair leaks will not be allowed.
 - 3. Procedure
 - a. All lift holes shall be plugged.
 - b. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.
 - c. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
 - d. Draw a vacuum in accordance with ASTM C1244-93
 - e. Draw a vacuum of at least 10.5 inches of mercury on the manhole, close and remove the vacuum line, and then adjust the vacuum so that the gauge reads 10.0 inches of mercury. If the time for the vacuum gauge reading to drop from 10.0 inches of mercury to 9.0 inches of mercury is equal to or less than the value taken from the following chart, the manhole will have passed the test. For rectangular structure, default to time based on equivalent cross sectional area of circular structure.

Depth, ft	Diameter, in (Time, Seconds)		
	48	60	72
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

4. Manhole vacuum tester assembly and vacuum pumps shall be as manufactured by Cherne Industries, Inc. or approved equal.
5. Pneumatic plugs shall be provided and installed in accordance with the above-approved manufacturer's recommendations.
6. The vacuum gauge shall be liquid filled, have 3.5-inch diameter face, and read from 0 to 30 inches of mercury. The test equipment shall allow the installation of two gauges at the same time.

3.06 PROTECTION

- A. Protect finished installation under provisions of Section 01 5000.

END OF SECTION 33 0513

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**SECTION 33 3111
SANITARY SEWER PIPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Buried Sanitary Force Main Piping, Fittings, and Accessories
- B. Testing for Sanitary Sewer.

1.02 RELATED REQUIREMENTS

- A. 22 1116 - Ductile Iron Piping
 - 1. Buried Sanitary Sewer Piping shall transition to Ductile Iron Pipe meeting the requirements of Section 22 1116 above grade and in exposed areas such as

1.03 REFERENCE STANDARDS

- A. ASTM D1784-08 - Standard Specification for Rigid Poly Vinyl Chloride (PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) Compounds.
- B. ASTM D1785 - Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- C. ASTM D 2241 - Standard Specification for Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series).
- D. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- E. ASTM D2729 - Standard Specification for Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.
- F. ASTM D 2855 - Standard Specification for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.
- G. ASTM D3139-98 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
- H. ASTM D 3212 - Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seal.
- I. ASTM F 477 - Standard Specification for Elastomeric Seals (Gaskets for Joining Plastic Pipe).
- J. AWWA C900-07 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 12 in., for Water Transmission and Distribution.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating pipe and pipe accessories.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Project Record Documents:
 - 1. Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.05 QUALITY ASSURANCE

- A. Certify that pipe, fittings, and materials are manufactured in accordance with applicable specifications.
- B. Certify that pipe materials and special fittings are manufactured in accordance with applicable specifications.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products under provisions of Section 01 6000.
- B. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.

- C. Coordinate deliveries to avoid conflict with conditions at site.
- D. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- E. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- F. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- G. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- H. Arrange storage in a manner to provide easy access for inspection.
- I. Maintain storage conditions to prevent deterioration or damage.
- J. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- K. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- L. Handle products by methods to prevent bending or overstressing.

1.07 PROJECT CONDITIONS

- A. Coordinate the work to connect buried piping to piping from structures and buildings
- B. Coordinate the work with other underground utilities

PART 2 PRODUCTS

2.01 FORCE MAIN MATERIALS

- A. Solid Wall Polyvinyl Chloride (PVC) Pipe, 4-inch to 24-inch
 - 1. Comply with AWWA C900 with ductile iron pipe equivalent outside diameters.
 - 2. Minimum Wall Thickness: Class 235 DR 18.
 - 3. PVC Plastic: ASTM D 1784, Cell Classification 12454
 - 4. Joint Type: All joints shall be restrained:
 - a. Integral Restrained Joint: Comply with AWWA C900 with restraining system manufactured integrally into pipe end
 - b. Mechanical Restrained Joint: Ductile iron mechanical device designed for joint restraint of AWWA C900 pipe complying with ASTM F 1674. Push on-joints according to AWWA C900.

2.02 FITTINGS

- A. General:
 - 1. Ductile iron compact fittings, mechanical joint, AWWA C153, 350 psi minimum pressure rating in cases where compact fittings are available; ductile iron standard fittings, mechanical joint, AWWA C110, 250 psi minimum pressure rating, only when C153 fittings are unavailable. Asphaltic exterior coating 1-mil thick, AWWA C104 standard thickness interior cement lining with seal coat.
 - a. Fittings shall include gaskets, glands, bolts, and nuts.
 - 2. Bolts and Nuts: Fluorocarbon coated cor-ten steel t-bolts and nuts equal to NSS cor-blue or High-strength low-alloy corrosion-resistant steel in accordance with ANSI/AWWA C111/A21.11.
 - 3. Wrap fittings with AWWA C105 polyethylene jacket.
 - 4. Restrained Joint Fittings - 4" through 48":

- a. Restraining mechanisms shall provide wedges or full circle contact and support of the pipe wall. Restraint shall be accomplished by a series of ring wedge segments mechanically restrained inside the gland housing and designed to grip the pipe wall in an even and uniform manner. Restrained devices shall be actuated by bolts featuring twist off heads to ensure proper installation torque is applied. All components of the restrainer, including the gland, bolts, and restraint segments shall be of high strength ductile iron, ASTM A536.
 - 1) Manufacturers:
 - (a) EBAA Iron Sales, Inc.: Series 2000PV Mechanical Joint Restraint Gland.
 - (b) Engineer Approved Equivalent.

2.03 POLYETHYLENE ENCASEMENT

- A. Polyethylene encasement, flat sheet or split tube, 8 mil (0.20mm) thickness, as per AWWA C105, for use with all buried ductile iron and steel pipe, fittings, valves and operators, and hydrants.
- B. Polyethylene shall be cut 2 feet longer than the pipe section and shall overlap the ends of the pipe by 1 foot.
- C. Gather and lap the polyethylene to provide a snug fit and secure at quarter points and each end with polyethylene tape.

2.04 PIPE ACCESSORIES

- A. Flange Adaptors: See Section 22 1116.01
- B. Couplings: See drawings. Connections to existing piping shall be made with ductile iron solid sleeve meeting 22 1116.
- C. PVC Sewer Main Coupling: All connections of new sanitary sewer piping to new or existing sanitary sewer piping shall be made with a watertight, flexible non-shear coupling.
 1. General: Coupling shall flex with earth movement, maintaining integrity of seal; coupling shall be leakproof, rootproof, corrosion resistant and rustproof; conform to applicable parts.
 2. Body: Elastomeric PVC; resistant to UV rays and sewer gases.
 3. Hardware: Minimum of two adjustable clamps per coupling; clamps, band screw and housing made from Stainless Steel Series 300.
 4. Approved manufacturers:
 - a. Fernco Part #1056-88-SR.
- D. Tracer Wire
 1. Use tracer wire with Force Main PVC pipe: No. 12 AWG solid copper conductor with Type HMWPE OR HDPE insulation intended for direct bury and shall be rated 600V where run in conduits with conductors operating over 30V.
 2. All tracer wire color coded per APWA standard: Green for Sewage.
 3. Splices: Use rosin core solder and plastic electricians tape.
 4. Ground Rod:
 - a. Copperweld or equal. Minimum 4-foot by 3/8-inch drive-in grounding rod. Ground wire shall extend up through the valve box, reaching at least 24-inches above grade.
 5. Terminal Box:
 - a. Tracer wire shall be brought to the surface at end of pipe or at intersection of main and service line next to a manhole, valve, vault, or building wall in a standard East Jordan 8550 valve box. Terminal Box covers provided by Operator.
 - b. Tracer wires and ground wires shall be terminated in an Erico Intersystem Bonding Termination Bar, or Equivalent.
 6. 2 inches wide detectable magnetic marking tape, blue, buried 12 inches to 18 inches above pipe.

2.05 BEDDING AND COVER MATERIALS

- A. Pipe Bedding Material: As specified in Section 31 2323.
- B. Pipe Cover Material: As specified in Section 31 2323.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements and elevations are as indicated on the Contract Drawings.
- B. Verify that piping system has been inspected and pressure tested.

3.02 PREPARATION

- A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.

3.03 TRENCHING

- A. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.04 INSTALLATION - PIPE

- A. Bench Marks and Stakes: Before laying pipe, verify all measurements at sits; make necessary field measurements to accurately determine sewer makeup lengths or closures. Preserve bench marks and stakes.
- B. Verify that trench cut and excavation base are ready to receive work and excavations, dimensions, and elevations are as indicated on drawings.
- C. Inspection for defects: Before installation, inspect pipe and appurtenances for defects and, when applicable, tap the pipe with a light hammer to detect cracks. Defective, damaged, or unsound pipe and appurtenances will be rejected.
- D. Do not displace or damage pipe when compacting.
- E. Install pipe, fittings, and accessories in accordance with these specifications and manufacturer's instructions. Seal watertight.
- F. Handling: Handle pipe and appurtenances in such a manner as to ensure delivery to the trench in a sound, undamaged condition.
- G. Begin at lowest point in line; lay bell ends pointing upstream.
- H. Cutting: Cut pipe, when necessary, in a neat and workmanlike manner without damage to the pipe, interior lining, and exterior coating. Perform cutting with an approved mechanical cutter, using a wheel cutter when applicable and practicable.
- I. Beveling: Grind smooth and bevel cut ends and rough edges using methods recommended by manufacturer.
- J. Assembling Pipe and Fitting Joints:
 - 1. General:
 - a. Assemble all joints in accordance with the manufacturer's recommendations.
 - b. Make joints with equipment recommended by pipe manufacturer; do not use backhoe to push joints together.
 - c. Remove all lumps, blisters, and excess coating material from the ends of the pipe.
 - d. Remove all oil and grease from the ends of the pipe.
 - e. Wipe clean and dry the outside of the spigot end, the inside of the bell, and the gasket, and keep free from dirt, sand, grit, or any foreign materials before the pipe is laid.
 - 2. Push-on Joints:
 - a. Place the gasket, if necessary, in the bell socket in accordance with the manufacturer's recommendations. Make sure the gasket faces the correct direction and that it is properly seated.
 - b. Apply lubricant to the gasket and spigot end of the pipe in accordance with the manufacturer's recommendations.

- c. Insert the beveled end of the spigot into the gasket in the bell end of the previously laid pipe section.
 - d. Push or pull the pipe "home" into the bell socket with care so not to damage piping, linings, coatings, or gaskets.
 - e. Pushing and pulling methods and means of protection of piping and appurtenances in accordance with the manufacturer's recommendations and approved by the Engineer.
 - f. Keep joint straight while pushing or pulling.
 - 3. Couplings:
 - a. Cut and smooth ends of existing and new pipe to fit; follow requirements above for cutting and beveling.
 - b. Install flexible watertight coupling, following manufacturer's installation instructions.
 - c. Do not exceed manufacturer's recommended torque limits.
- K. Laying of Pressure Lines:
 - 1. Pipe deflections:
 - a. Deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall not exceed the manufacturer's recommendations for the type and size of pipe and joint being restrained.
 - b. If the alignment requires deflections in excess of the manufacturer's limitations, then bend fittings, rotate fittings, or a sufficient number of shorter lengths of pipe shall be used to provide angular deflections within the limits set forth.
 - 2. Pipe Gradient:
 - a. In certain instances, it may be required that a positive gradient be maintained for pressure lines.
 - b. Where changes from positive to negative grades occur, air release or combination air release and air/vacuum valves and manholes are required.
 - c. Where end point and/or fitting elevations are given on a pipe, a constant slope shall be provided between joints, after any necessary vertical deflections are obtained.
- L. Cleaning and Protection of Pipelines:
 - 1. Interior of the pipe clear of all dirt and superfluous materials.
 - 2. Whenever the pipe layers leave the trench for any reason, no matter for how short a time, effectively close the exposed end of the pipe to prevent the entrance of animals, dirt, or foreign objects.
- M. Pipe Deflections:
 - 1. Deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall not exceed the manufacturer's recommendations for the type and size of pipe and joint being used.
 - 2. If the alignment requires deflections in excess of the manufacturer's limitations, then bend fittings or a sufficient number of shorter lengths of pipe shall be utilized to provide angular deflections within the limits set forth.

3.05 CONFLICT WITH EXISTING UTILITIES

- A. Provide temporary support for existing water, gas, telephone, power, and other utility services that cross trench until backfilling of the trench has been completed.
- B. Compact backfill under existing utility crossing to 95% maximum density; moisture content not less than 2% below optimum or more than 3% above optimum moisture content.

3.06 PROTECTION OF WATER SUPPLIES

- A. When wastewater sewers are proposed in the vicinity of any water supply facilities, construction shall conform to acceptable isolation distances in the following requirements:

1. Horizontal Separation - Sewers shall be laid at least 10 feet (3.0 m) horizontally from any existing or proposed water main. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot (3.0 m) separation, the Department of Environmental Quality ("Department") may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the gravity sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on one side of the gravity sewer and at an elevation so the bottom of the water main is at least 18 inches (450 mm) above the top of the sewer.
2. If it is impossible to obtain proper horizontal and vertical separation as described above for gravity sewers, both the water main and gravity sewer must be constructed of slip-on or mechanical joint pipe complying with public water supply design standards of the Department and be pressure tested to 150 psi (1034 kPa) to assure watertightness.
3. Sewers Crossing Under Water Mains - The sewer shall be laid to provide a minimum of 18 inches (450 mm) from the top of the sewer to the bottom of the water main. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.
4. Sewers Crossing Over Water Mains - Either the water main or the sewer main must be encased in a watertight carrier pipe that extends 10 feet (3.0m) on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be PVC, ABS, or HDPE, and the ends sealed with a rubber gasket or boot.

3.07 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 4000.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.08 TESTING

- A. Hydrostatic Test
 1. Test all pressure lines for leakage after satisfactory completion of cleaning and flushing of piping and appurtenances.
 2. Test using Ashcroft Model 1082 with 4.5" dial face at 1 psi increments.
 3. Subject newly laid piping or any valved section of piping to a hydrostatic pressure test for at least two hours.
 4. Conduct pressure tests on individual piping sections between valves in order to test the integrity of the valves as well as the piping.
 5. The test pressure shall be as directed by Engineer. The test pressure not less than 1.25 times the working pressure at the highest point along the test section and not less than 1.5 times the working pressure at the point of testing.
 6. Pressure shall be maintained for a minimum of 2 hours.
 7. Before applying the pressure, completely expel air from the system being tested.
 8. Install, at Contractor's expense, corporation cocks as required at all high points in the system if necessary to completely expel all air.
 9. After all the air has been expelled, remove corporation cocks and plug or close prior to testing. Owner to determine whether the corporation cocks are removed or left in place.
 10. Perform leakage test if requested in writing by Engineer. Leakage tests will be required after unsatisfactory hydrostatic pressure tests.
 11. Satisfactory hydrostatic pressure results are 1 psi or less of pressure loss over 2 hours.
 12. At the option of the Engineer, pressure and leakage tests may be conducted simultaneously.
 13. Determine amount of leakage by adding water to the system by means of a pump where pressure within the system is maintained within 5 psi of the test pressure.
 14. When testing at pressures other than 150 psi, allowable leakage shall not exceed that computed as follows: $L = (ND \times \text{Square Root}[P]) / 7400$. Where L=Allowable leakage (gallons per hour), N=Number of joints in length being tested, D=Nominal diameter of the pipe (inches), and P=Average test pressure (psi gauge)

15. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallons per hour per inch of nominal valve size is allowed.
16. Determine acceptance on the basis of allowable leakage.
17. If any test of pipe laid discloses leakage greater than that specified above, the Contractor shall, at his expense, locate and repair the defective material until the leakage is within the specified allowance.
18. Repair all visible leaks regardless of the amount of leakage.
19. Damaged or defective pipe, fittings, valves, hydrants, or joints discovered in the pressure test shall be replaced by the Contractor and the test repeated until the test results are satisfactory.

3.09 PROTECTION

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 33 3111

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**SECTION 43 2114
ROTARY LOBE PUMP EQUIPMENT**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section covers single stage adjustable speed rotary lobe type pumping units for the following:
 - 1. One (1) Thickened Waste Activated Sludge (TWAS) Transfer Pump to be installed in the RDT Building.
 - 2. One (1) Thickened Sludge (TS) Transfer Pump to be installed in the RDT Building.

1.02 REFERENCES

- A. ANSI B 16.1 - Cast Iron Pipe Flanges and Flanged Fittings Class 125.
- B. ASTM A 48 - Standard Specification for Gray Cast Iron Castings.
- C. NEMA MG 1 - Motors and Generators.
- D. NFPA 70 - National Electrical Code.
- E. SSPC SP10 - Near White Finish.

1.03 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings showing arrangement, dimensions, and materials.
- C. Shop Drawings showing layout of pumps, required suction and discharge fittings, and existing suction and discharge piping.
- D. Complete assembly, foundation, and installation drawings, together with detailed specifications and data covering materials, drive unit, parts, devices, and accessories forming a part of the equipment furnished, shall be submitted in accordance with the submittals section. The data and specifications for each unit shall include, but shall not be limited to, the following:
 - 1. Pumps
 - a. Manufacturer, type and model, rpm at rated condition, size of suction flange, size of discharge flange, maximum bhp requirement at maximum differential pressure condition, complete performance curves (for adjustable speed units, at maximum and minimum speeds), Net weight of pump and baseplate, base and anchor bolt details.
 - 2. Motors
 - a. Name of manufacturer, type and model, Horsepower rating, temperature rating and service factor, full load rotative speed, full load current, locked rotor current.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Operation and maintenance manuals according to Section 01780.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Receive and unload shipments to plant site from suppliers of equipment under this contract.
- B. Unload equipment as soon as possible after arrival.
- C. Pay freight car and truck demurrage, detention, and any other costs which may be billed to Owner due to failure to unload cars or trucks within time required by freight companies.
- D. Provide physical protection for equipment placed in storage.
 - 1. Support stored equipment above ground and cover with canvas or other heavy-duty sheeting. Cover shall be securely fastened and shall be replaced if torn or otherwise damaged during storage period.
 - 2. Store motors in dry, warm place and in accordance with manufacturer's recommendations. Motors over 20 hp shall have shaft rotated 90 degrees each month. Provide Engineer with evidence that this requirement is met.

3. Maintain desiccant between cover and motor frames on motors. Provide desiccant of type permitting visual determination of condition of desiccant. Replace desiccant when it becomes ineffective.
4. Store the following items in weatherproof, heated (minimum 50 degrees F.) building complete with bins for storage of small pieces of equipment. Storage inside of existing treatment plant not available.
 - a. Electronic instruments and cabinets.
 - b. Electrical equipment with general purpose enclosures.
 - c. Insulation materials.
 - d. Rotating equipment.
 - e. Miscellaneous electronic equipment, gaskets, and small machined parts.
 - f. Instruments and controls.
- E. Inspect stored equipment weekly. Renew protective coatings as necessary to preserve fitness of equipment.
- F. Provide for safekeeping of materials or equipment received. Store and maintain materials and equipment after receipt until completed installation is accepted by Owner. Such storage and maintenance shall be in accordance with manufacturer's recommendations and requirements of these Specifications. Provide materials, equipment, and labor required for such storage and maintenance.
- G. Contractor shall be accountable for any deterioration of materials or equipment occasioned by improper storage or maintenance, and shall recondition, repair, or replace any such materials or equipment without additional cost to Owner.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01400 and to sign the Certificate of Proper Installation attached at the end of that section.
- B. Include necessary trips by the manufacturer's representative to provide two separate 8-hour work days on-site (travel time not included) for startup and training of operations personnel. Training may be video taped by Owner.
- C. Additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.06 START-UP, COMMISSIONING, AND TRAINING

- A. Factory test all pumps at manufacturer's plant. Perform tests in accordance with test code of Hydraulic Institute Standards. Pump test will not be witnessed by Owner or Engineer.
- B. Test curves shall cover full range of operation from shutoff to maximum capacity; plot capacity as abscissa; plot operating head, brake horsepower, efficiency and NPSHR as ordinates.
- C. Test Points:
 1. Minimum operating pressure.
 2. Design (rated) pressure.
 3. Maximum differential pressure.
- D. Test Tolerances:
 1. Operate pumps during tests within one of the following tolerances:
 - a. At rated head: +10%/-0% of the rated capacity.
 - b. At rated capacity: +5%/-0% of the rated head.
 2. No minus tolerance or margin with respect to capacity or total head at rated or specified condition.
- E. Power and Torque Test
 1. Measure shaft power input, ensuring the motor or drive is correctly sized.
 2. Evaluate mechanical efficiency under load.

- F. Provide shop space, tools, equipment, instruments, personnel, and facilities required for satisfactory completion of tests.
- G. Submit test curves and allow Engineer's review prior to pump shipments.

1.07 SPARE PARTS AND SPECIAL TOOLS

- A. Spare parts shall be properly bound and labeled for easy identification without opening the packaging and suitably protected for long term storage.
- B. One (1) set of all special tools required for normal operation and maintenance shall be provided.
- C. For each pump:
 - 1. One (1) set cartridge mechanical seals
 - 2. One (1) spare rotor set, as specified
 - 3. One (1) set of front and back wear plates

1.08 WARRANTY

- A. Full warranty against defects in materials and workmanship for two (2) year after Substantial Completion by the Owner, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Boerger
- B. No substitutions.

2.02 PERFORMANCE AND DESIGN REQUIREMENTS

- A. Pumping units shall be designed for the following operating conditions and requirements at rated speed, unless otherwise noted:
 - 1. Thickened Waste Activated Sludge Transfer Pumps
 - a. Design Condition: 150 gpm at 30 psi and 223 rpm
 - b. Minimum Trundown Required: 6:1
 - c. Drive type: Adjustable speed
 - d. Number of stages: 1
 - e. Pumped material: Thickened Waste Activated Sludge
 - f. Anticipated percent solids: 5%
 - g. Pump Model: PL300
 - h. Suction Size: 6 inches
 - i. Discharge Size: 6 inches
 - j. Motor Horsepower (hp): 7.5
 - k. Maximum Motor RPM: 1800
 - l. Motor Orientation: Piggy-back
 - 2. Thickened Sludge Transfer Pumps
 - a. Design Condition: 150 gpm at 75 psi and 181 rpm
 - b. Minimum Trundown Required: 6:1
 - c. Drive type: Adjustable speed
 - d. Number of stages: 1
 - e. Pumped material: Thickened Sludge
 - f. Anticipated percent solids: 7%
 - g. Pump Model: FL-518
 - h. Suction Size: 6 inches
 - i. Discharge Size: 6 inches
 - j. Motor Horsepower (hp): 30
 - k. Maximum Motor RPM: 1800
 - l. Motor Orientation: Piggy-back

- B. Each pumping unit shall be furnished complete with an electric motor, frame, V-belts, guards, etc. for a complete system. Each pump and drive unit shall be mounted on a common baseplate as indicated on the Contract Drawings, and shall be provided with anchor bolts and all other appurtenances specified or otherwise required for proper operation.
- C. Equipment furnished and installed under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with Contract Drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by the Engineer. Hydraulic considerations and definition of terms shall be as set forth in the Hydraulic Institute Standards.
- D. Pump shall be able to operate running dry without damage to internals.
- E. Rotary Lobe Pumps shall be designed abrasion resistant.
- F. All fluid-wetted parts including mechanical seal shall be replaceable through the quick release front cover without disassembly of the pump unit or connecting pipe system.
- G. Pumps with seal water requirements are not acceptable.
- H. Pumps shall operate in either direction.
- I. Sludge pumping equipment shall be suitable for continuous operation at all operating speeds specified.
- J. Equipment shall be free from shock, vibration, cavitation, overheating, and excessive noise while operating at specified conditions.
- K. Equipment shall be continuous operation without damage while operating under load.
- L. Design equipment so parts are readily accessible for inspection and repair, easily duplicated and replaced, and suitable for service specified.

2.03 PUMP CONSTRUCTION AND MATERIALS

- A. Each pump shall be of heavy duty, positive displacement rotary lobe design. The wet end shall be constructed of High Wear Resistant Special Steel.
- B. The front cover shall be constructed of Grey Cast Iron (GG-25), with a minimum Brinell hardness of 230 - 260, and permit removal of the rotors without disturbing piping, bearings, and mechanical seals.
- C. The case shall also be machined to accept a reversible front and rear wear plate, constructed of High Wear Resistant Special Steel, to a finished hardened reversible surface of 370-430 HB Brinell. Pumps not equipped with a removable wear plate that use the front door for its wear surface or require bolts that are recessed below the lobe path, are not acceptable for any wearing surface.
- D. The pump shall utilize at minimum, HiFlo® 4-tip rotors, which are driven through positive timing gears running in oil. Solid cores of Grey Cast Iron A36 shall be covered with a layer of NBR, with a Durometer hardness 58. The geometry of the rotor core shall be the same as that of the finished rotor. The rotor shall be specifically designed for pumping digested sludge. Rotors shall be positioned to the shaft by replaceable hardened key ways, and secured to the shaft by internal/external expansion bolt and flush discs requiring no recesses in the end cover. Pumps utilizing lobe designs with fewer than 4 tips, will not be considered, due to the high potential for wear on the lobes, as a result of fewer sealing lines. Designs with replaceable lobe tips shall not be acceptable.
- E. Both front and rear rotor case cover plates shall be fitted with a renewable hardened wear surfacing, with a minimum Brinell hardness of 370-430 HB Brinell. Rotors shall be positioned on the shaft by replaceable hardened key ways, and secured to the shaft by internal/external expansion bolt that is tightened from the inside of the support cover.

- F. The shafts shall be of carbon steel ASTM A293 fitted with replaceable stainless steel sleeves where passing through the seal area. They shall be timed in their rotation by straight cut timing gears running in a separate oil chamber which also contains the ball and roller bearings for each shaft. Pumps requiring external re-timing in the event of blockage will not be considered. The shaft shall be a minimum of 85 mm in diameter where the rotors, bearings, and mechanical seals contact the shaft, to decrease the potential of torsional shaft fatigue. The use of step down, angular v-notch cut, or threaded, shafts will not be acceptable due to shaft fatigue and potential of breakage. The shaft sleeves where the mechanical seal rides, shall be removable through the front of the pump, when removing the cartridge mechanical seal, and without disturbing the surrounding piping. Maximum shaft deflection at operating pressure shall be 0.0016 inch.
- G. Cartridge mechanical seals shall be provided of Seal Carrier in Mild Steel 304 Stainless Steel, Cr2O3 (Chrome Oxide Coated) vs. Duronit for each positive displacement pump. The seal shall include the mechanical seal faces, the seal holder and carrier, all applicable o-rings, the mechanical seal faces, and stainless steel shaft sleeve. The use of manual pre-load mechanical seals will not be accepted. A blocking chamber located behind the mechanical seal, and in front of the bearing housing lip seal shall be fitted into the cartridge seal of the pump to prevent contamination of the bearings on the event of a seal failure. This chamber shall be suitable for fill, from the top of the pump, and have an external pressurized oil bottle to review the status of the mechanical seals operation, mounted on the top of the pump, located in easy view of the operator. Pumps with open to air cavities located behind the mechanical seal housing, those that require water flush or quench, or those without oil bottles, will not be accepted, due to their potential for product spill failure on the surrounding areas of the pump, and the added maintenance and cost associated with mechanical seal water flushing systems.
- H. Port connections shall be ANSI Class 150 # raised face, 6 inch Gooseneck x GPA.151 designed flanges to reduce the chance of vapor locking, and increase the reliability and suction lift capability, through its unique design. They shall be hot dipped galvanized steel, for long life, and abrasion resistance.
- I. The removable end cover shall be flush with no recesses or dead pockets where solids can accumulate. The cover shall be sealed with NBR o-rings and provide complete access to the pump chamber without disconnecting pipe work glands or bearings. The removable front cover is to be mounted to the pump with 4 individual bolts to provide unhindered access to the rotors to facilitate ease of maintenance and operator safety.
- J. The pump and motor shall be mounted on a steel base plate complete with necessary, guards, and mounting hardware.
- K. Pumps and motors shall operate at any point within their operating range without undue noise and vibration. Vibration at any point in the operating range shall not exceed the limits allowed by the Hydraulic Institute.
- L. The top and bottom housing segments of the pump shall be constructed of Grey Cast Iron (GG-25), hardened to a minimum of 75-105 HB Brinell, and be adjustable based on wear. The adjustment shall be accomplished by simply moving steel shims from one hole to the next in the pump housing, allowing for the closing of tolerance around the rotors. This adjustment must be available a minimum of two times from factory tolerance. The use of one-piece, block, cast housings or the use of radial wear plates will not be accepted; due to the fact that their ability to be hardened is limited and frequent replacement when a rebuild is required due to wear.
- M. Bearings shall be B-10 Life, 100,000 hours. Bearings and timing gears for all pump sizes shall run in an oil chamber provided with a bolt to show the level with the centerline of the lower shaft.
- N. The pump timing gears shall run in oil and shall be mounted in a gear case contiguous with the pump case. The gear case shall be fitted with oil fill and drain connections on the top and bottom. Designs that use side drains will not be acceptable, due to the inability to completely drain the fluids on the pump.

- O. The manufacturer shall be ISO 9001 2000 compliant, as evidenced with a current ISO certificate at the time of bid. Manufacturers that are ISO compliant, but not certified to ISO 9001 2000 will not be considered.

2.04 ACCESSORIES

A. Gauges

1. Each pump shall be provided with a pressure gauge in the suction and discharge piping.
2. Gauges shall conform to ANSI/ASME B40.1 and shall be indicating dial type, with C-type phosphor bronze Bourdon tube, stainless steel rotary geared movement, phenolic open front turret case, adjustable pointer, stainless steel or phenolic ring, and acrylic plastic or shatterproof glass window.
3. The dial shall be 4 1/2 inches in diameter, with white background and black markings. Pointer travel shall be not less than 200 degrees nor more than 270 degrees of arc.
4. All gauges shall be accuracy Grade A or better.
5. The units of measurement of pressure gauges shall be pounds per square inch.
6. Each gauge shall be provided with 1/4-inch NPT connections, and with a threaded end ball-type shutoff valve as specified in the miscellaneous valve section (22 0523.50).
7. The gauges shall be connected to the piping as indicated on the Contract Drawings.
8. Gauges shall be manufactured by Ashcroft, Onyx Valve Company, or Engineer approved equivalent.

B. Pressure Switches

1. Switch: UL listed, Single Pole, Double Throw switch, manual reset, 1/4 inch NPT pressure connection and 1/2 inch NPT electrical termination. Suction pressure range up to 10 psi for both pumps. Discharge pressure range up to 50 psi for TWAS pump and up to 100 psi for TS pump. Field adjustable setpoints 15-100% of range with setpoint repeatability of +/- 1% of full range.
2. Enclosure: Water tight, epoxy coated pressure switch enclosure meeting NEMA 4X requirements.
3. Material: Buna-N or Teflon diaphragm.
4. Manufacturer: Ashcroft B-series - B428
5. Each switch shall be provided with a threaded end ball-type shutoff valve as specified in the miscellaneous valves section (22 0523.50).
6. The pressure switches shall be connected to the piping as indicated on the Contract Drawings.

C. Isolators

1. Isolators shall be provided on the suction and discharge piping as indicated on the Contract Drawings.
2. Each gauge and pressure switch shall be isolated from the pumped liquid by means of an in-line, flow-through, flange type gauge isolator.
3. The isolator shall consist of a carbon steel housing, carbon steel assembly flanges, and a Vinton flexible liner, and shall be filled with silicone oil.
4. The isolator shall be suitable for installation between two flat-faced, ANSI/ASME B16.1, Class 125 cast iron pipe flanges and shall be tapped for a 1/2 inch NPT gauge connection.
5. Isolators shall be Red Valve "Series 40 Flanged Sensor", OPW Engineered Systems "Iso-Ring", Ashcroft, Onyx Valve Company "Isolator Ring", or Engineer approved equivalent.

2.05 DRIVE UNITS

- A. Each pump shall be driven by an electric motor connected to the pump through a V-belt drive. V belt and sheave groove dimensional tolerances shall be in accordance with the "Engineering Standards - Multiple V-Belt Drives" published by the Multiple V Belt Drive and Mechanical Power Transmission Association. The speed reduction ratio of V-belt drives shall not exceed 4 to 1. Sufficient clearance shall be provided to allow access to the stuffing box.
- B. Electric Motors:

1. Each motor shall be horizontal, premium efficient, squirrel-cage induction type, rated 230/460 volts, 3 phase, 60 Hz.
 2. Each motor shall be provided with an enclosure with lifting lugs, suitable for the hazard classification listed in the Performance and Design Requirements.
 3. Each motor used in conjunction with an adjustable frequency drive or inverter duty rated shall be furnished with at least one automatically reset motor winding temperature switch per phase. Temperature switch contacts shall be normally closed and rated 5 amperes at 120 volts ac. The contacts shall be wired in series, with the end leads brought out to the motor terminal box. Switches shall be as recommended by the motor manufacturer.
 4. A warning nameplate shall be provided on each motor used in conjunction with an adjustable frequency drive or inverter duty rated to warn the operator to trip the main breaker prior to performing maintenance.
 5. Minimum service factor of 1.15.
 6. Motor Bearings: Anti-friction, sized for L10 life of 50,000 hours.
 7. Mechanical equipment, including drives and electric motors shall be supplied and installed in accordance with applicable OSHA regulations. Stainless steel guards shall be installed on all rotation assemblies. The noise level of motors, unless otherwise noted, shall not exceed 85 dBA measured 3 meters from the unit under free field conditions while operating on utility power.
 8. Variable speed motors shall be inverter duty rated.
- C. The nameplate ratings of the motors shall not be exceeded, nor shall the design service factor be reduced when the pump is operating at any point on its characteristic curve at maximum speed.

2.06 IDENTIFICATION

- A. Permanently attach stainless steel nameplate to pump with the following information:
1. Equipment number.
 2. Serial number of pump.
 3. Rated Capacity in gpm.
 4. Rated pumping head in feet.
 5. Speed in rpm.
 6. Manufacturer's name.
 7. Size and type of pump.
 8. Design pressure.
- B. Cast-in or permanently attached direction of rotation arrow.
- C. Stainless steel motor nameplate with horsepower, speed, power characteristics, efficiency, enclosure type, power factor, and other data.

2.07 PAINTING

- A. Paint in accordance with Section 09 9000.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions and Section 46 0500, as indicated on Contract Drawings, by qualified craftsmen.
- B. Location, orientation, and quantities as indicated on Contract Drawings.
- C. Include all required related items necessary for a complete installation.
- D. Coordinate for compatibility of manufacturer's shop coating and final finish.
- E. Support and anchor as indicated on Contract Drawings.
- F. Start up in presence of manufacturer's service representative.
- G. Test power draw and motor vibration during initial operation with manufacturer's service representative.

- H. Each pumping unit shall be leveled, plumbed, aligned, and wedged into position to fit connecting piping. Installation procedures shall be as recommended by the pump manufacturer and the Hydraulic Institute Standards, and as required herein. Grouting shall be with non-shrink grout as specified in Section 03 3000.
- I. The pump base shall be grouted after initial fitting and alignment, but before final bolting of connecting piping. Special care shall be taken to maintain alignment of pumping unit components. No stresses shall be transmitted to the pump flanges. After final alignment and bolting, pump connections shall be tested for applied piping stresses by loosening the flange bolts. If any movement or opening of the joints is observed, piping shall be adjusted to proper fit.

END OF SECTION 43 2114

SECTION 43 2117
VORTEX (TORQUE-FLOW) PUMPING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. One (1) Vortex (Torque-Flow) digester transfer pump to be installed in the Digester Control Building basement.

1.02 REFERENCES

- A. ASTM A48 - Standard Specification for Gray Cast Iron Castings.
- B. ASTM A532 - Standard Specification for Abrasion Resistant Cast Iron.
- C. NEMA MG 1 - Motors and Generators.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop drawings:
 - 1. General:
 - a. Acknowledgement that products submitted comply with the requirements of the standards referenced.
 - b. Manufacturer's delivery, storage, handling, and installation instructions.
 - c. Equipment identification utilizing numbering system and name utilized in Drawings.
 - d. Equipment installation details:
 - 1) Location of anchorage.
 - 2) Type, size, and materials of construction of anchorage.
 - 3) Anchorage setting templates.
 - 4) Manufacturer's installation instructions.
 - e. Equipment areas classification rating.
 - f. Shipping and operating weight.
 - g. Equipment physical characteristics:
 - 1) Dimensions (both horizontal and vertical).
 - 2) Materials of construction and construction details.
 - h. Equipment factory primer and paint data.
 - i. Manufacturer's recommended spare parts list.
 - j. Equipment lining and coatings.
 - k. Equipment utility requirements include air, natural gas, electricity, and water.
 - 2. Mechanical and Process Equipment:
 - a. Operating characteristics:
 - 1) Technical information including applicable performance curves showing specified equipment capacity, rangeability, and efficiencies.
 - 2) Brake horsepower requirements.
 - 3) Copies of equipment data plates.
 - b. Piping and duct connection size, type and location
 - c. Equipment bearing life certification.
 - d. Equipment foundation data:
 - 1) Equipment center of gravity.
 - 2) Criteria for designing vibration, special or unbalanced forces resulting from equipment operation.
 - 3. Pumping Equipment:
 - a. Preliminary Submittal: Characteristic performance curves for pumps, showing total dynamic head, pump runout, shutoff head, efficiency, brake horsepower, and net

- positive suction head required plotted against capacity in gpm. Include full curve from shutoff head to maximum capacity for all impeller sizes. Indicate operating point and impeller diameter being furnished. None - N/A
- b. Second submittal after Engineer returns preliminary submittal: Certified shop test curves. Include TDH, efficiency, BHP, shutoff head, pump runout, NPSHR plotted against flow in GPM. Indicate operating point and impeller diameter furnished.
4. Electrical Equipment:
- a. Electric motor information:
- 1) Documentation that motors provided are high efficiency units.
 - 2) Nameplate data.
 - 3) Motor rated for Class 1, Div 1, Group D.
 - 4) Service factor on motors 1/2 HP and above.
 - 5) Motor enclosure type.
 - 6) NEMA frame size.
 - 7) NEMA design code.
 - 8) Insulation type and temperature rise.
 - 9) Locked rotor current on motors 10 HP and above.
 - 10) Efficiency and power factor at full load, 3/4 load, and 1/2 load.
 - 11) Power factor correction data for motors 10 HP and larger. Provide recommendation from motor manufacturer giving highest capacitor size in KVAR that may be used with each motor, or provide motor manufacturer's published curve based on factory tests, showing plot of power factor versus load. For electric motors greater than 75 HP, submit the following additional information:
 - (a) Motor current, efficiency and power factor at:
 - (1) Full load, 3/4 load, and 1/2 load.
 - (2) Locked rotor current.
 - (3) Stall time damage point.
 - (b) Motor test reports demonstrating motor capabilities equal to or in excess of the following standard defined criteria.
 - (1) Sound level by NEMA MG 1-12.53.
 - (2) Number of starts by NEMA MG 1-12.54.
 - (3) Routine tests by NEMA MG 1-12.55.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Operation and maintenance manuals according to Section 01 7800.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Receive and unload shipments to plant site from suppliers of equipment under this contract.
- B. Unload equipment as soon as possible after arrival.
- C. Pay freight car and truck demurrage, detention, and any other costs which may be billed to Owner due to failure to unload cars or trucks within time required by freight companies.
- D. Provide physical protection for equipment placed in storage.
1. Support stored equipment above ground and cover with canvas or other heavy-duty sheeting. Cover shall be securely fastened and shall be replaced if torn or otherwise damaged during storage period.
 2. Store motors in dry, warm place and in accordance with manufacturer's recommendations.
 3. Maintain desiccant between cover and motor frames on motors. Provide desiccant of type permitting visual determination of condition of desiccant. Replace desiccant when it becomes ineffective.

4. Store the following items in weatherproof, heated (minimum 50 degrees F) building complete with bins for storage of small pieces of equipment. Storage inside of existing treatment plant not available.
 - a. Electronic instruments and cabinets.
 - b. Electrical equipment with general purpose enclosures.
 - c. Insulation materials.
 - d. Rotating equipment.
 - e. Miscellaneous electronic equipment, gaskets, and small machined parts.
 - f. Instruments and controls.
- E. Inspect stored equipment weekly. Renew protective coatings as necessary to preserve fitness of equipment.
- F. Provide for safekeeping of materials or equipment received. Store and maintain materials and equipment after receipt until completed installation is accepted by Owner. Such storage and maintenance shall be in accordance with manufacturer's recommendations and requirements of these Specifications. Provide materials, equipment, and labor required for such storage and maintenance.
- G. Contractor shall be accountable for any deterioration of materials or equipment occasioned by improper storage or maintenance, and shall recondition, repair, or replace any such materials or equipment without additional cost to Owner.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and to sign the Certificate of Proper Installation attached to Section 01 4000.
- B. Include necessary trips by the manufacturer's representative to provide one 8-hour work day on-site (travel time not included) for startup and training of operations personnel. Training may be videotaped by Owner.
- C. Additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.06 START-UP, COMMISSIONING, AND TRAINING

- A. Factory test all pumps at manufacturer's plant. Perform tests in accordance with test code of Hydraulic Institute Standards. Pump test will not be witnessed by Owner or Engineer.
- B. Test curves shall cover full range of operation from shutoff to maximum capacity; plot capacity as abscissa; plot operating head, brake horsepower, efficiency and NPSHR as ordinates.
- C. Test Points:
 1. Shutoff.
 2. Pump runout.
 3. Design operating point.
 4. Two additional points, one on each side of the rated operating point.
- D. Test Tolerances:
 1. Operate pumps during tests within one of the following tolerances:
 - a. At rated head: +10%/-0% of the rated capacity.
 - b. At rated capacity: +5%/-0% of the rated head.
 2. No minus tolerance or margin with respect to capacity or total head at rated or specified condition.
- E. Provide shop space, tools, equipment, instruments, personnel, and facilities required for satisfactory completion of tests.
- F. Submit test curves and allow Engineer's review prior to pump shipments.

1.07 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after final acceptance by the Owner, including all parts, labor, and expenses.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. WEMCO Model C.
- B. No Substitutions

2.02 GENERAL

- A. Minimal Solids Passage: 4-inch.
- B. Assure increasing head characteristic from secondary design condition to shutoff condition.
- C. Job Conditions:
 - 1. Digested Sludge: Intermittent Service

2.03 PUMP CONSTRUCTION

- A. Pumps shall be recessed impeller vortex type and shall be complete with equipment and accessories as follows:
 - 1. Pump casings, bearing housings, and pump pedestals shall be super Ni-hard ASTM A532 (Minimum Brinell Hardness = 650).
 - a. Provide handhole in the pump casings or provide an independently replaceable suction flange made of ASTM A532 shall be provided. The suction flange shall be easily assessable and replaceable, without the need to disassemble any other components of the pump..
 - b. Pump casing strength to withstand 150 percent of shutoff head.
 - c. Fabricate casing for impeller removal without disturbing suction and discharge piping.
 - d. Cast case of the following minimum thickness for severe duty units: 9/16 IN.
 - e. Suction piece (severe duty units):
 - 1) Provide the following minimum thickness at areas of greatest wear: 1 IN.
 - 2. Suction and Discharge: ANSI Class 125 lb. rated flanged nozzles.
 - a. Contractor shall tap suction and discharge piping into and out of pumps for pressure gauge. Contractor shall provide pressure gauge (see details on Drawings) mounted on Isolation Ring. Isolation Ring shall be Onyx Series PSW or engineer approved equivalent.
 - 3. Impellers shall be super Ni-hard ASTM A532 (Minimum Brinell Hardness = 650) and dynamically balanced.
 - a. Recess type with semi-open design.
 - b. Secure to keyed shaft by impeller bolt locked against tapered shaft.
 - c. Cup type impeller.
 - d. Removable wear plate in back of impeller designed to direct flow from behind impeller to center of volute for maximum protection of casing.
 - e. Provide wear plate separate from stuffing box.
 - f. Statically and dynamically balance per HI standards.
 - 4. Pump shafts shall be of high grade, turned, ground, and polished steel.
 - a. Size shaft to transmit full driver output.
 - b. Accurately machine and construct shaft.
 - c. Provide positive shaft seal between shaft sleeve and shaft for full length of sleeve.
 - d. Fabricate shaft for maximum deflection of 0.002-inches measured at the stuffing box.
 - 5. Each pump shall have two sets of deep-grooved ball bearings designed for both radial and thrust load. These bearings shall be so spaced that the distance between them is greater than the distance between the center of the impeller and the first bearing. The bearings

shall be mounted in a dust and moisture-proof housing that is bolted to the pump casing to insure permanent alignment. Equipment bearing housing with a pressure venting device and oil fill, level and drain taps.

- a. Furnish ball-type bearings suitable to sustain all loads encountered in service conditions. Minimum B-10 life of 100,000 hours.
6. Common Bases shall be provided for mounting of the pumps and drives. The bases shall be fabricated of steel, all welded construction, with grout holes, and deep channel drip lip design. Drainage connections shall be furnished at both ends.
7. A coupling guard shall be factory mounted to each base to protect personnel from rotating parts at the coupling.
8. Slurry Seal Single Cartridge Flushless Seal: A single cartridge seal requiring no flushing shall be furnished in the pump.
9. Furnish sleeve type imbedded anchor bolts for securing the pumps to the foundations.

2.04 ELECTRIC DRIVES

- A. A fabricated steel base with a minimum thickness of 3/8" shall be provided that is suitable to adequately support the weight of the pump, motor, drive and drive guard. Motor shall be installed above pump in piggyback orientation.
- B. An adjustable motor base shall be furnished whose design is such that the motor can easily be moved to accommodate appropriate tensioning of the V-belt drive.
- C. A "stationary control" variable speed drive complete with belts and sheaves shall be installed on the base with the pump and motor. This type of drive is to provide a means to adjust speeds while the drive is not operating.
- D. An enclosed and approved metal belt guard shall be provided.
- E. Motors shall conform to NEMA Design B, constant speed, 40 degrees C, ambient design.
- F. See Division 26 requirements.

2.05 SPARE PARTS

- A. Shaft Sleeve: One each pump.
- B. Full gasket kits: One set.
- C. Mechanical Seals: One set.

2.06 IDENTIFICATION

- A. Permanently attach stainless steel nameplate to pump with the following information:
 1. Equipment number.
 2. Serial number of pump.
 3. Rated Capacity in gpm.
 4. Rated pumping head in feet.
 5. Speed in rpm.
 6. Manufacturer's name.
 7. Size and type of pump.
 8. Design pressure.
- B. Cast-in or permanently attached direction of rotation arrow.
- C. Stainless steel motor nameplate with horsepower, speed, power characteristics, efficiency, enclosure type, power factor, and other data.

2.07 PAINTING

- A. All external surfaces of the pumps and motors, except where stainless steel, aluminum or other corrosion-resistant materials are used, given one (1) shop coat of rust-inhibitive primer. The compatibility of the primer with specified finish coats to be verified by the Contractor.

- B. Field finish painting according to Section 09 9000.
- C. All touch-up and field coatings furnished and applied by the Contractor.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions and Section 46 0500, as indicated on drawings, by qualified craftsmen.
- B. Location, orientation, and quantities as indicated on drawings.
- C. Include all required related items necessary for a complete installation.
- D. Coordinate for compatibility of manufacturer's shop coating and final finish.
- E. Support and anchor as indicated on drawings.
- F. Start up in presence of manufacturer's service representative.
- G. Test power draw and motor vibration during initial operation with manufacturer's service representative.

3.02 PUMP SCHEDULE

- A. One (1) Digester Transfer Pump:
 - 1. Rated Design Point: 500 GPM @ 28' TDH.
 - 2. Maximum Shut-Off Head (feet): 36
 - 3. Nominal speed (rpm): 785
 - 4. Discharge Size (in): 4
 - 5. Suction Size (in): 5
 - 6. Drive Type: V-Belt
 - 7. Maximum Motor Horsepower (hp): 10.
 - 8. Motor Configuration: Horizontal.

END OF SECTION

**SECTION 43 2139
SUBMERSIBLE SOLIDS HANDLING PUMP**

SUBMERSIBLE SOLIDS HANDLING PUMP

1.01 SCOPE

- A. This section covers guiderail-mounted, single-stage, submersible, nonclog, end suction centrifugal pumping units and controls.
- B. Each pumping unit shall be complete with a close-coupled, submersible electric motor, a floor-mounted discharge base and elbow, guiderails, and all other appurtenances specified or otherwise required for proper operation.
- C. Each pumping unit shall be rated and labeled for use in a Class I, Division 1 area.

1.02 GENERAL

1.03 REFERENCE STANDARDS

- A. ISO 9001 - Quality Management Systems — Requirements.
- B. Equipment furnished and installed under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by the Engineer. Hydraulic considerations and definition of terms shall be as set forth in the Hydraulic Institute Standards.
- C. General Equipment Stipulations
 - 1. Unless otherwise specified, the General Equipment Stipulations shall apply to all equipment furnished under this section.
- D. Power Supply
 - 1. Power supply to equipment will be 460 volts, 60 Hz, 3 phase.

1.04 SUBMITTALS

- A. Complete fabrication, assembly, foundation, and installation drawings, together with detailed specifications and data covering materials, parts, devices, and accessories forming a part of the equipment furnished, shall be submitted in accordance with the submittals section. The data and specifications for each unit shall include, but shall not be limited to, the following:
 - 1. Pumps
 - a. Name of manufacturer, Type and model, Rotative speed, Size of suction elbow inlet, Size of discharge elbow outlet, Net weight of pump and motor only, Complete performance curves showing capacity versus head, bhp, NPSH required, Efficiency, Data on shop painting.
 - 2. Motors
 - a. Name of manufacturer, Type and model, Type of bearing and method of lubrication, Rated size of motor, hp, Temperature rating, Full load rotative speed, Net weight, Efficiency at full load and rated pump condition, Full load current, Locked rotor current.
 - 3. Control Panel and Components
 - a. Name of manufacturer, Type and model, Dimensions and net weight of complete panel, Overcurrent characteristics and details of motor control, Liquid level sensors with mounting details and cable lengths, and pump controls.
- B. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 SERVICE CONDITIONS

2.02 PERFORMANCE AND DESIGN REQUIREMENTS

- A. Waste Activated Sludge Pumps #1 and #2: (WASP-1010 and WASP-1020)
 - 1. Quantity: 2.

2. Design Point: 300 GPM @ 35' TDH
 3. Static Head: 12 ft.
 4. Nominal Speed (rpm): 1,800.
 5. Minimum Pump Efficiency(%): 65.4.
 6. Motor Horsepower (hp): 5.5.
 7. Rating: 3 phase, 460 VAC, 60 Hz.
 8. Class 1, Division 2 application.
 9. Variable Speed.
 10. Explosion proof application.
- B. Pump performance shall be stable and free from cavitation and noise throughout the specified operating head range at minimum suction submergences. The design running clearance between the impeller inlet and the casing wearing ring (if provided) shall be not less than 0.01 inch or 1 mil per inch of casing wearing ring diameter, whichever is greater.
- C. Pumps shall be suitable for pumping wastewater with solids concentrations of up to 3% by weight and shall be capable of passing 1.5" – 3" spheres without clogging.
- D. Pumps shall be suitable for continuous operation at flow conditions stated herein without excessive noise, vibration, heating, cavitation, or damage to pump.
- E. Pump performance shall be stable and free from cavitation and noise throughout the specified operating head range at minimum suction submergences. The design running clearance between the impeller inlet and the casing wearing ring shall be not less than 0.01 inch or 1 mil per inch of casing wearing diameter, whichever is greater.
- F. Head characteristics for pumps: Continuously rising as flow is decreased. Shutoff head shall be minimum of 1.35 times rated head.
- G. Size pumps to allow increase in rated pump head by as much as 10% by replacement of impellers.
- H. Pump, appurtenances, and cable shall be capable of continuous submergence underwater to depth of (actual depth up to 65') without loss of watertight integrity.
- I. Each pumping unit shall be designed so that reverse rotation at rated head will not cause damage to any component.

2.03 MANUFACTURERS

- A. Flygt

2.04 MATERIALS

- A. Stator Housing, Oil Chamber Housing, and Impeller Casing: Cast iron, ASTM A48.
- B. Impeller: Hard Iron, ASTM A-532, Alloy III A, 25% Chrome Cast
- C. Insert Rings: Hard Iron, ASTM A-532, Alloy III A, 25% Chrome Cast
- D. Shaft: Alloy steel, hard chrome plated; or martensitic stainless steel, AISI Type 416 or 420. All Wetted Assembly Fasteners: Stainless steel. Mechanical Seals: 2 tandem single type, oil lubricated with silicon or tungsten carbide seal rings at all points, except the upper rotating seal, which shall be carbon.
- E. Discharge Base: Cast Iron. Guiderails: Stainless steel pipe, ASTM A312, Schedule 40S.
- F. All castings must be blasted before coating. All wet surfaces are to be coated with two-pack oxyrane ester Duasolid 50. The total layer thickness should be at least 120 microns.
- G. Anchor Bolts
1. All anchor bolts, nuts, and washers shall be stainless steel and shall comply with the recommendations of the pump manufacturer.

2.05 PUMP CONSTRUCTION

- A. Impeller Casing

1. The impeller casing shall have well-rounded water passages and smooth interior surfaces free from cracks, porosity, blowholes, or other irregularities. The discharge nozzle shall be flanged with dimensions and drilling conforming to ANSI B16.1, Class 125 and sufficiently rigid to support the guiderail-mounted pumping unit under all operating conditions.
- B. Impeller
 1. The impeller shall be a semiopen or enclosed one-piece casting with not more than two nonclog passages. The interior water passages shall have uniform sections and smooth surfaces and shall be free from cracks and porosity. The impeller shall be dynamically balanced and securely locked to the shaft by means of a key and self-locking bolt or nut.
- C. Insert Rings
 1. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation to remain unobstructed. The insert rings shall provide effective sealing between the multi-vane semi-open impeller and the volute housing.
- D. Oil Chamber Housing
 1. The oil chamber shall contain a drain plug and a vent plug.
- E. Mechanical Seals
 1. Each pump shall be provided with two mechanical rotating shaft seals arranged in tandem and running in an oil chamber. The lower seal unit between the pump and the oil chamber shall contain one stationary and one positively driven rotating tungsten carbide ring. The upper seal unit between the oil chamber and the stator housing shall contain one stationary tungsten carbide ring and one positively driven rotating carbon ring. Each interface shall be held in contact by an independent spring system designed to withstand maximum suction submergence. The seals shall require neither maintenance nor adjustment and shall be readily accessible for inspection and replacement.
 2. Shaft seals lacking positively driven rotating members or conventional double mechanical seals which utilize a common single or double spring acting between the upper and lower units and requiring a pressure differential to offset external pressure and effect sealing, will not be acceptable. The seals shall not rely upon the pumped media for lubrication and shall not be damaged if the pumps are run unsubmerged for extended periods while pumping under load.
- F. Sealing of Mating Surfaces
 1. All mating surfaces of major components shall be machined and fitted with O-rings where watertight sealing is required. Sealing shall be accomplished by O-ring contact on four surfaces and O-ring compression in two planes, without reliance on a specific fastener torque or tension to obtain a watertight joint. The use of elliptical O-rings, gaskets, or seals requiring a specific fastener torque value to obtain and maintain compression and water-tightness will not be acceptable. The use of secondary sealing compounds, gasket cement, grease, or other devices to obtain watertight joints will not be acceptable.
- G. Guiderail-Mounted Pumps
 1. Discharge Base
 - a. A discharge base and discharge elbow shall be furnished by the pump manufacturer for each pumping unit. The base shall be sufficiently rigid to firmly support the guiderails, discharge piping, and pumping unit under all operating conditions. The base shall be provided with one or more integral support legs or pads suitable for bolting to the floor of the wetwell. The face of the discharge elbow inlet flange shall be perpendicular to the floor and shall make contact with the face of the pump discharge nozzle flange. The diameter and drilling of the elbow outlet flange shall conform to ANSI B16.1, Class 125.
 2. The pump and motor assembly shall be automatically connected to and supported by the discharge base and guiderails so that the unit can be removed from the wetwell and replaced without the need for operating personnel to enter the wetwell.

3. Sliding Bracket
 - a. Each pumping unit shall be provided with an integral, nonsparking and self-aligning guiderail sliding bracket. The bracket shall be designed to obtain a wedging action between flange faces as final alignment of the pump occurs in the connected position. The bracket shall maintain proper contact and a suitably sealed connection between flange faces under all operating conditions.
4. Guiderails
 - a. Each pumping unit shall be equipped with one or more guiderails. Guiderails shall be sized to fit the discharge base and the sliding bracket and shall extend upwards from the discharge base to the access hatch cover at the top of the wetwell. An upper guide-rail bracket of AISI Type 304 stainless steel shall be provided.
5. Lifting Chain
 - a. A chain suitable for removing and installing each pump shall be selected and provided by the pump manufacturer. The chain shall be stainless steel. A suitable chain hook shall be provided at the top of the wetwell.

2.06 FABRICATION AND MANUFACTURE

- A. Painting
 1. All castings must be blasted before coating. All wet surfaces are to be coated with two-pack oxyrane ester Duasolid 50. The coating shall have a dry film thickness of at least 6 mils and shall consist of a prime (first) coat and one or more finish coats. At least 1 quart of the finish coat material shall be furnished with each pump for field touchup.
 2. All other iron and steel surfaces, except stainless steel and machined surfaces, shall be shop painted as specified in 09 9000.

2.07 BALANCE

- A. All rotating parts shall be accurately machined and shall be in as nearly perfect rotational balance as practicable. Excessive vibration shall be sufficient cause for rejection of the equipment. The mass of the unit and its distribution shall be such that resonance at normal operating speeds is avoided. In any case, the unfiltered vibration displacement (peak-to peak), as measured at any point on the machine, shall not exceed 4 mils.
- B. At any operating speed, the ratio of rotative speed to the critical speed of a unit or its components shall be less than 0.8 or more than 1.3.

2.08 ELECTRICAL MOTORS

- A. Each pump shall be driven by an air-filled, totally submersible electric motor manufactured by the pump manufacturer. Each motor shall be rated 460 volts, 60 Hz, 3 phase and shall have a service factor of 1.05. Motor nameplate rating shall exceed the maximum horsepower required by the pump in the operating head range. The stator housing shall be an air filled, watertight casing. Motor insulation shall be moisture resistant, Class F, 155°C. Each motor shall be NEMA Design B for continuous duty at 40°C ambient temperature, and designed for at least 10 starts per hour.
- B. The motor bearings shall be antifriction, permanently lubricated type. The lower bearing shall be fixed to carry the pump thrust and the upper bearing free to move axially. The bearings shall have a calculated AFBMA L10 Life Rating of 40,000 hours when operating at maximum operating head. Maximum shaft runout at the mechanical seals shall not exceed 2 mils at any point in the operating head range.
- C. Each motor shall be capable of continuous operation in air (unsubmerged) for at least 24 hours under pump full load conditions, without exceeding the temperature rise limits for the motor insulation system.

- D. Each pump shall be equipped with one or more multiconductor cable assemblies for power and control. Each multiconductor assembly containing power cables shall be provided with a separate grounding conductor. Each cable assembly shall bear a permanently embossed code or legend indicating the cable is suitable for submerged use. Cable sizing shall conform to NEC requirements. All cables shall be of sufficient length to terminate in a junction box outside the wetwell as indicated on the drawings, with 10 feet of slack which will be coiled in the wetwell. Each cable shall be supported by AISI Series 300 corrosion-resistant stainless steel Kellems or woven grips to prevent damage to the cable insulation. Mounting of cable supports in the wetwell shall be coordinated by the supplier to prevent damage to the cable.
- E. The cable entry water seal shall include a strain relief and a grommet type seal designed so that a specific fastener torque is not required to ensure a watertight, submersible seal. The cable entry
 - 1. junction box and motor shall be separated by a stator lead sealing gland or a terminal board. The junction box shall isolate the motor interior from moisture gaining access through the top of the stator housing.
- F. The motor and its integral protective controls shall be rated and labeled for use in a Class I, Division 1 under submerged conditions.

2.09 CONTROLS

- A. Pump Controls
 - 1. Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.
 - 2. The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.
- B. Enclosures
 - 1. Enclosures for control power transformers, auxiliary relays, and other control components shall be NEMA Type 1.

2.10 SHOP TESTS

- A. Each completed and assembled pump/motor unit shall undergo the following factory tests at the manufacturer's plant prior to shipment. The Manufacturer shall provide on demand a copy of his quality control plan for these tests and an ISO 9001 factor certificate:
 - 1. Minimum 3-point hydraulic performance test
 - 2. No-leak seal integrity test
 - 3. Electrical integrity test

PART 3 EXECUTION

3.01 INSTALLATION

- A. Each discharge base shall be leveled, plumbed, aligned, and wedged into position to fit connecting piping. Installation procedures shall be as recommended by the pump manufacturer and the Hydraulic Institute Standards. Grouting shall be as specified in the grout section.
- B. Install in accordance with manufacturer's instructions and Section 46 0500, as indicated on drawings, by qualified craftsmen.
- C. Provide access space around equipment for service. Provide no less than minimum as recommended by manufacturer.
- D. Include all required related items necessary for a complete installation.
- E. Coordinate for compatibility of manufacturer's shop coating and final finish.
- F. Support and anchor as indicated on drawings.

- G. Start up in presence of manufacturer's service representative.
- H. Test power draw and motor vibration during initial operation with manufacturer's service representative.
- I. Contractor and/or manufacturer's representative to perform operating check:
 - 1. Check the pump and piping for leaks.
 - 2. Provide (if necessary) and record pressure gauge reading for discharge in PSIS.
 - 3. Check and record flow rate in US GPM.
 - 4. Check and record wet well level in feet.
 - 5. Check and record voltage, amperage per phase and kilowatts.

3.02 FIELD TESTS

- A. Two continuous operation tests of at least 4 hours' duration shall be run on each pump after installation:
 - 1. The first test shall be run with the motor in air (unsubmerged) and the wetwell liquid level held below the motor.
 - 2. The second test shall be run with the motor submerged and fully loaded.
- B. At the end of 10 days of level-controlled operation by the Owner, the pump will be accepted if, in the opinion of the Engineer, it has operated satisfactorily without excessive motor overheating, power use, wear, or need for lubrication, or requiring undue attention; and if all its rotating parts operate without excessive vibration or noise at any operating head, including shutoff.

END OF SECTION 43 2139

**SECTION 46 0500
EQUIPMENT INSTALLATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Equipment Installation Requirements.

1.02 REFERENCES

- A. ANSI B31.1 - Code for Power Piping.
- B. ASME - Boiler and Pressure Vessel Code.
- C. AWS D1.1 - Welding in Building Construction.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate location and extent of proposed field welding, and provisions that have been made for type of base metal, present stress conditions, and preheating requirements.
- C. Submit certificates for each welder, indicating proof of qualifications as outlined in code, prior to any field welding, either temporary or permanent.

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. Receive and unload shipments to plant site from suppliers of equipment under this contract.
- B. Unload equipment as soon as possible after arrival.
- C. Pay freight car and truck demurrage, detention, and any other costs which may be billed to Owner due to failure to unload cars or trucks within time required by freight companies.
- D. Provide physical protection for equipment placed in storage.
 - 1. Stored equipment shall be supported above ground and shall be covered with canvas or other heavy-duty sheeting. Cover shall be securely fastened and shall be replaced if torn or otherwise damaged during storage period.
 - 2. Motors shall be stored in dry, warm place and in accordance with manufacturer's recommendations. Motors over 20 hp shall have shaft rotated 90° each month. Provide Engineer with evidence that this requirement is met.
 - 3. Desiccant shall be maintained between cover and motor frames on motors. Provide desiccant of type permitting visual determination of condition of desiccant. Replace desiccant when it becomes ineffective.
 - 4. Following items shall be stored in weatherproof, heated (minimum 50°F building complete with bins for storage of small pieces of equipment).
 - a. Electronic instruments and cabinets.
 - b. Electrical equipment with general purpose enclosures.
 - c. Insulation materials.
 - d. Rotating equipment.
 - e. Miscellaneous electronic equipment, gaskets, and small machined parts.
 - f. Instruments and controls.
- E. Inspect stored equipment weekly. Renew protective coatings as necessary to preserve fitness of equipment.
- F. Provide for safekeeping of materials or equipment received. Store and maintain materials and equipment after receipt until completed installation is accepted by Owner. Such storage and maintenance shall be in accordance with manufacturer's recommendations and requirements of these Specifications. Provide materials, equipment, and labor required for such storage and maintenance.

- G. Contractor shall be accountable for any deterioration of materials or equipment occasioned by improper storage or maintenance, and shall recondition, repair, or replace any such materials or equipment without additional cost to Owner.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and to sign Certificate of Proper Installation attached to Section 01 4000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Before assembly or erection, thoroughly clean equipment of temporary protective coatings and foreign materials; completely remove shop-applied flushing compounds.
- B. Blow out with compressed air as required to remove foreign material.
- C. After erection of equipment, clean external surfaces of oil, grease, dirt, or other foreign materials; touch up shop paint, primer, and filler; leave surfaces smooth and ready for finish painting.

3.02 INSTALLATION

- A. Install in strict accordance with manufacturer's instructions.
- B. Provide access space around equipment for service. Provide no less than minimum as recommended by manufacturer.

3.03 SPECIAL ERECTION PROCEDURES

- A. Field welding to existing structural members shall conform to following requirements:
 - 1. Conform to AWS D1.1.
 - 2. Welding to high strength steels or preheating of highly-stressed members will not normally be permitted.
 - 3. Remove any temporary welded attachments, grind area smooth, and apply one coat of primer to match existing primer.
- B. Welding of piping shall conform to ANSI B 31.1 Code for Power Piping and ASME Boiler and Pressure Vessel Code, Section IX when either or both are applicable.
- C. Remove any temporary attachments made to equipment. Grind area of attachment on equipment to smooth surface and apply one coat of primer to match existing primer.

3.04 SPECIAL EQUIPMENT TO BE PROVIDED

- A. Provide dowel pins and shims necessary for leveling and doweling equipment to baseplates. Shims shall be stainless steel.
- B. Provide bolting required to anchor equipment securely to building structural steel; holes required in structural steel shall be drilled; burning with cutting torch not allowed.
- C. Provide expansion anchors where required, subject to review by Engineer. Use appropriate type of anchor devices on vibratory equipment.
- D. Provide welding rod for field erection of equipment installed under this contract.

3.05 FLOOR SHORING

- A. Shore any parts of structure for which design loading would be exceeded during construction or installation of equipment.
- B. Protect flooring and other finished surfaces by means of heavy planking.
- C. Remove shoring and repair any damage to floors or other parts of structures after equipment has been installed.

3.06 EQUIPMENT ALIGNING

- A. Align equipment in accordance with manufacturer's recommendations.

- B. Use shims of sheet and plate steel; use shims with laminations having individual layers not heavier than 0.015" for 1/32" to 1/8" directly under equipment.
- C. Check alignment of equipment after piping and other external connections have been made and before equipment is placed in operation. Realign equipment as necessary.
- D. After alignment, hot run and recheck alignment; drill and ream items of equipment and fasten to baseplates with tapered dowel pins.
- E. Include costs for labor required to obtain alignment within allowable limits on equipment installed and for any hanger adjustments required.

3.07 EQUIPMENT SUPPORTS

- A. Provide devices to support equipment.
- B. Fabricate supports of structural steel sections, plates, or rods arranged to provide rigid and sturdy mounting for equipment.
- C. Provide connections or fasteners required between equipment supports and building structure.
- D. Equipment foundation pads: As indicated on drawings.
- E. Provide devices to support equipment piping and appurtenances where specific support is not detailed on Drawings. Support piping adjacent to equipment such that no weight is carried on equipment.

3.08 GROUTING

- A. Place a minimum of 1" nonshrink grout under equipment being mounted on concrete foundations unless specified otherwise. See Division 3 specifications for non-shrink grout.
- B. Determine quantity of grout required.
- C. Space between top of foundation and bottom of equipment base shall be filled with grout, free of any voids.
- D. Place no grout that has been allowed to set, after mixing, beyond time limitations set forth by grout manufacturer.

END OF SECTION 46 0500

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**SECTION 46 3333
POLYMER FEED SYSTEM**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Liquid Polymer Feed System and Accessories associated with the Rotary Drum Thickeners to be located in the RDT Building.

1.02 REFERENCES

- A. NEMA - Motors and generators.
- B. NEC - Electrical circuits.

1.03 DESIGN REQUIREMENTS

- A. Capable of automatically metering, diluting, activating, and feeding a liquid polymer with water.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings showing:
 - 1. Detailed scope of supply.
 - 2. Arrangement, dimensions, and materials.
 - 3. Equipment performance data and operating characteristics.
 - 4. Manufacturer's catalog data, marked to indicate materials being furnished.
 - 5. Wiring diagrams, schematics, and information for electrical and controls.
 - 6. Electrical component data sheets.
- C. Operation and maintenance manuals as described in Section 01 7800.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND PROTECTION

- A. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with conditions at site.
- C. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- D. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- E. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- F. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- G. Arrange storage in a manner to provide easy access for inspection.
- H. Maintain storage conditions to prevent deterioration or damage.
- I. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- J. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- K. Handle products by methods to prevent bending or overstressing.

1.06 WARRANTY

- A. Full warranty against defects in materials and workmanship for two (2) year after substantial completion, including all parts, labor, and expenses.

1.07 SERVICE REPRESENTATIVE

- A. Provide qualified Service Representative to perform functions described in Section 01 4000 and to sign the Certification of Proper Installation attached to Section 01 4000.
- B. Include necessary trips by the Manufacturer's representative to provide two 8-hour work days on-site, travel time not included, for startup and training of operations personnel.
- C. Any additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.08 MAINTENANCE

- A. Unit shall be open frame design to allow easy access to all components.
- B. Mixing chamber shall be easily disassembled and reassembled to allow access to all parts exposed to neat polymer.

PART 2 PRODUCTS

2.01 POLYMER FEED SYSTEM

- A. Manufacturers
 - 1. VeloDyne.
 - 2. Prominent.
 - 3. Cleanwater1.
 - 4. Engineer approved equivalent.
- B. See Contract Drawings for non-potable water connection and location of polymer feed system. Polymer feed system shall include polymer mixing chamber, polymer pump, control valves, flowmeters, dilution water assembly, solution discharge assembly, electric controls, instrumentation, and miscellaneous accessories for a complete operational system.
- C. Design Requirements
 - 1. Two (2) polymer dilution/feed equipment units designed to automatically mix liquid polymer with water to meter, dilute, activate, and feed the polymer to the Rotary Drum Thickeners.
 - a. Dilution Water for polymer unit associated with WAS RDT: 60-600 gph.
 - b. Dilution Water for polymer unit associated with Digested Sludge RDT: 240-2400 gph.
 - c. Metering Pump for polymer unit associated with WAS RDT: 0.1 - 2.0 gph neat polymer.
 - d. Metering Pump for polymer unit associated with Digested Sludge RDT: 0.25 - 5.0 gph neat polymer.
 - e. Expected Max Polymer Dosage for WAS RDT: 15 lbs/DT active polymer.
 - f. Expected Max Polymer Dosage for Digested Sludge RDT: 15 lbs/DT active polymer.
 - g. Estimated Polymer Density: 8.6 lb/gal.
 - h. Estimated Polymer Specific Gravity = 1.03.
 - 2. Polymer Feeder/Blender Skids
 - a. Each polymer feeder/blender unit shall be mounted on a skid, maximum skid dimensions: 40" wide by 34" deep by 72" high.
 - b. All electrical components mounted on the skid shall be wired to the control panel by the equipment manufacturer and all wiring shall be in suitable conduit. The only field wiring required shall be the power supply and I/O wiring as shown on the Contract Drawings.
 - c. Each feeder/blender unit shall be capable of automatically metering, diluting, activating (at a user-established concentration) and sending the solution to the feed point.
 - d. Each feeder/blender unit shall be provided with all equipment, internal piping, and valves required for proper operation and shall be provided as a complete skid mounted assembly.

- e. All metal components in contact with the polymer or polymer solutions shall be type 304 stainless steel. All piping material shall be Schedule 80 PVC. Valves shall be constructed of stainless steel or PVC and shall use Viton seats and seals. All components that require periodic maintenance shall be readily accessible. The skid shall be constructed of Type 304 stainless steel. The skid shall have forklift points for ease of transportation. All fasteners, bolts, supports, hardware, and etc. shall be constructed of stainless steel.
- 3. Mixing Chamber
 - a. Polymer and water shall be mixed in a chamber designed to create sufficient mixing energy without moving parts. Water volume shall be controlled by a throttling valve. Polymer activation efficiency shall be consistent over the dilution water range.
 - b. Mixer motor shall be a variable speed and washdown duty. The motor shall not exceed 1 hp.
 - c. Capable of delivering activated polymer into a feed line with a back pressure of 0 to 20 psi.
 - d. Dilution water shall be supplied at a minimum pressure of 40 psig over the entire flow range. Systems requiring a higher water pressure for proper polymer activation shall include an integral, skid mounted booster pump with all associated controls. Pumps and controls shipped loose for field installation shall not be acceptable.
 - 1) Systems requiring a higher water pressure for proper polymer activation shall not be acceptable. Pumps and controls shipped loose for field installation shall not be acceptable.
- 4. Dilution Water Control
 - a. Dilution water shall be split into two streams. The primary water flow shall supply the mixing chamber. The secondary water flow shall be used to post dilute the activated polymer stream if needed by the manufacturer's design. These two streams shall be completely blended prior to exiting the unit.
 - b. Each stream shall have an electronic flow sensor with immersed in-line element capable of transmitting a signal to the unit micro controller for display of flow rate. Element shall be removable without plumbing disassembly.
 - c. Each stream shall have a rate control valve for isolation of or throttling of water flow. Valve shall be constructed of stainless steel or PVC with EPDM seals.
 - d. Unit shall have an electric solenoid valve for on/off control of total dilution water flow.
- 5. Neat Polymer Metering Pump
 - a. Each feeder/blender skid shall have a neat polymer metering pump. Pump shall be progressing cavity type, having materials of construction selected for resistance to the pumped solution, at least Type 304 stainless steel rotors and Viton rubber stators. Each pump shall be a heavy-duty universal pin joint type. Each pump shall have a minimum 2 stage chemically resistant rigid stator. The pump and drive shall be mounted on a structural steel baseplate complete with a drip rim, drainage connection, and suitable guards.
 - b. The pump shall have a stable head-capacity curve and be free from cavitation and objectionable noise. Pumping heads and other terms shall be as defined in the Hydraulic Institute Standards.
 - c. The pump shall use packing gland seals and shall not require seal water.
 - d. Capable of pumping polymer with apparent viscosities of up to 45,000 cps.
 - e. Maximum Discharge Pressure: 100 psi.
- 6. Accessories
 - a. Solution Discharge Pressure gauge
 - 1) The pressure gauge shall be liquid filled and incorporated with a 2.5" dial with a range of 0 to 160 psi. The body shall be Type 316 stainless steel.
 - b. Neat Polymer Metering Pump Calibration column:

- 1) One transparent plastic calibration column shall be furnished and installed on each neat polymer metering pump suction pipe. Each column shall be 2 inch ID, constructed of clear PVC or other chemical-resistant rigid, transparent plastic tubing, with a nominal 1/8 inch wall thickness and complete with vented top cap and 1 inch screwed flow fitting.
 - 2) Each column shall be graduated in 100 mL increments over a range of 0 to 1,000 mL, complete with a numeral at each graduation.
 - c. Neat Polymer Metering Pump Pressure relief valve
 - 1) Valve shall apply open when system pressures exceed the preset pressure setting of the valve.
 - 2) Valve body shall be PVC. Diaphragm shall be PTFE-faced with non-chatter design. Valve diaphragm shall be held against seat by an internal spring. When the pre-set pressure is exceeded, the diaphragms shall open to allow chemical flow-through. Spring shall be field-adjustable from 0 to 150 psi.
 - d. Union connection
 - 1) Connections shall be PVC.
 - e. Check Valve with quick disconnect
 - 1) Valve body shall be brass or stainless steel.
7. Pump Controls
 - a. Refer to Central Control (25 9100) Section provided under Division 25.
 - b. Enclosure: NEMA 4X (FRP). Enclosure shall be non-metallic and of waterproof design.
 - c. Power Disconnect Type: 120 VAC, 60 Hz., 1 Ph, 10 ft Cord with Plug.
 - d. External mode shall allow for automatic polymer pump pacing based on a 4-20 mA analog input signal.
 - e. Unit shall be powered through an on-off-remote circuit. In the remote mode, the unit shall accept a run signal. Unit is manually powered in the on mode. Controller shall indicate mode of operation with LED.
 - f. Unit shall have a dilution water loss of flow sensor, which sensing that water flow has been interrupted for any reason, will place the polymer pump on standby and will restart it automatically when flow is restored. An integral timer shall monitor loss of flow and energize contacts indicating alarm after 15 second of continuous loss. Controller shall indicate loss of water alarm with indicator.
 - g. Controller LED display shall indicate:
 - 1) Metering Pump Rate.
 - h. Controller shall have pre-preprogrammed auto-flash cycle which will disable polymer pump yet allow dilution water to flow through system for a pre-set time at each shutdown.
 - i. Controller shall have dry contacts for these outputs:
 - 1) General alarm
 - 2) Run status
 - j. Controller shall have additional LED indication of these:
 - 1) Loss of water flow alarm.
 - 2) Loss of polymer flow alarm.
 - 3) Additional configurable alarm.
 - 4) Run status.
 - k. Controller shall have 4-20 mA data output proportional to 0-100 percent pump speed.
- D. Material Specifications
 1. Connections - Plumbing:
 - a. Dilution water inlet: 1 1/2-inch FNPT.
 - b. Neat polymer inlet: 1/2-inch FNPT.
 - c. Solution discharge: 1 1/2-inch FNPT.
 2. Connections - Electrical:
 - a. Standard, grounded male plug: 120/1/60, 5 amp.

- b. Terminal blocks: 4-20 mA signal input.
- c. Terminal blocks: Dry contact input for remote start.
- d. Terminal blocks: Dry contact alarm output.
- e. Terminal blocks: Dry contact run output.
- f. Terminal blocks: Dry contact HOA in Auto output.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installed in accordance with Manufacturer's recommendations and Section 46 0500, by qualified craftsmen.
- B. Location, orientation, and quantities as shown on the Contract Drawings.
- C. Unless otherwise specified or indicated on the Contract Drawings, each item of chemical feed equipment shall be anchored to a concrete equipment pad. Refer to Contract Drawings for details.
- D. Include all required-related items for a complete installation.
- E. Coordinate for compatibility of manufacturer's shop coating and final finish.
- F. Support and anchor as indicated on Contract Drawings and as specified in section 22 0529.
- G. Start up in presence of manufacturer's service representative.

3.02 TESTING

- A. Water and chemical solution lines shall be pressure tested for at least one hour with no loss of pressure.
- B. Test Pressure: 150 psi
- C. Test Medium: Water
- D. Specified test shall be made at the expense of the Contractor, and to the satisfaction of the Engineer.
- E. Purge all neat liquid polymer tubing or piping between the neat polymer tote and the polymer blending units with mineral oil to remove residual water prior to introducing neat polymer. Following purging, drain as much of the mineral oil out of the system as possible. Dispose of purged fluids and waste mineral oil in accordance with local environmental regulations.

END OF SECTION 46 3333

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**SECTION 46 7133
ROTARY DRUM SLUDGE THICKENING SYSTEM**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. One (1) waste activated sludge (WAS) and one (1) digested sludge rotary drum thickener (RDT) to be installed in the RDT Building.
- B. The rotary drum thickeners shall be provided complete with all accessories, spare parts, mounting anchor bolts, booster pumps, and other appurtenances as specified and as may be required for a complete operational system.

1.02 REFERENCES

- A. National Electrical Manufacturers Association (NEMA) MG1 - Motors and Generators.
- B. American Friction Bearing Manufacturers Association (AFBMA).
- C. American Iron and Steel Institute (AISI).
- D. American National Standards Institute (ANSI).
- E. American Society for Testing and Materials (ASTM):
 - 1. A36, Standard Specification for Carbon Structural Steel.
 - 2. A123, Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
 - 3. A666, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- F. American Welding Society (AWS).

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Certification of compatibility of all variable speed drives with motors provided.
 - 2. Utility utilization rates and pressures.
 - 3. Provide complete manufacturers installation instructions, construction details, materials of construction, electrical diagrams, and motor and drive details.
 - 4. Provide complete layout drawings showing locations of ancillary equipment, foundation requirements and supporting calculations, and utility connections.
 - 5. Calculation of bearing life.
 - 6. Screen specifications including type and mesh size (rotary drum thickener).
 - 7. Documentation necessary to verify that thickening unit complies with specified construction.
 - 8. Performance test protocol.
 - 9. Characteristic performance curves for washwater booster pumps, showing total dynamic head, pump runout, shutoff head, efficiency, brake horsepower, and net positive suction head required plotted against capacity in gpm. Include full curve from shutoff head to maximum capacity for all impeller sizes. Indicate operating point and impeller diameter being furnished.
 - 10. Test reports for washwater booster pumps as specified herein.
 - 11. Descriptive literature, bulletins, and/or catalog cut sheets of the equipment which include complete manufacturer's specifications and materials of construction.
 - 12. Complete NEMA motor nameplate information.
 - 13. Special handling instructions and requirements for storage and protection prior to installation.
- C. Provide copy of Performance Bond as described in this specification.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 1. Manufacturer's Certification of Proper Installation per Section 01 4000.
- E. Operation and maintenance manuals according to Section 01 7800.

- F. Performance Test Report:
 - 1. Performance test report.
 - a. Summary of testing procedures, schedule, analyses, and details.
 - b. Testing results.
 - c. Comparison of test results to minimum performance requirements.
 - d. Presentation of data and results in graphical form.
- G. Qualifications:
 - 1. Manufacturer shall have at least ten (10) years experience in the design and manufacture of the specified equipment.
 - 2. Evidence of experience in having at least ten (10) installed and currently operating assemblies of similar type and size, and have been in successful operation for at least five (5) years.

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. See Section 01 6000.
- B. Deliver, store, and handle all equipment for thickening system according to manufacturer's recommendations.
- C. Arrange delivery of products in accordance with construction schedules and to allow inspection prior to installation.
- D. Coordinate deliveries to avoid conflict with conditions at site.
- E. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.
- F. Clearly mark to identify partial deliveries of component parts to facilitate assembly.
- G. Store products immediately on delivery and protect until installed. Storage to be done according to manufacturer's instructions with seals and labels intact and legible.
- H. Provide platforms, blocking or skids, or coverings required to protect products from deterioration or damage.
- I. Arrange storage in a manner to provide easy access for inspection.
- J. Maintain storage conditions to prevent deterioration or damage.
- K. Protect products after installation to prevent damage from subsequent operations. Remove when no longer needed.
- L. Provide equipment and personnel necessary to handle products by methods to prevent damage to products or packaging.
- M. Handle products by methods to prevent bending or overstressing.

1.05 SERVICE REPRESENTATIVE

- A. Provide qualified service representative to perform functions described in Section 01 4000 and to sign the Certificate of Proper Installation attached to Section 01 4000.
- B. Employ and pay for services of equipment manufacturer's field service representative(s) for a minimum of 48 on-site hours over two trips to:
 - 1. Inspect equipment covered by these specifications.
 - 2. Supervise adjustments and installation checks.
 - 3. Provide Owner with a written statement that manufacturer's equipment has been installed properly, started, tested, and is ready for operation by Owner's personnel.
 - 4. Operate equipment during Performance Testing.
 - 5. Training of operations personnel. Training may be video taped by Owner.
- C. Additional trips required by the Contractor before or after final startup and training shall not be charged to the Owner.

1.06 PROJECT/SITE CONDITIONS

- A. Sludge Characteristics:
 - 1. Waste activated sludge (WAS) will originate from two (2) existing WAS Holding Banks.
 - 2. WAS will be pumped from the WAS Holding Basins with two (2) submersible non-clog pumps directly to the RDT Building and into the WAS Thickening RDT. New WAS pumps will be installed as part of this project.
 - 3. It is expected that average detention time within the WAS Holding Tanks will be less than 24 hours.
 - 4. WAS feed sludge solids concentration: range of 0.30-0.50 percent TSS.
 - 5. Digested sludge will originate from Digester 3.
 - 6. Digested sludge will be transferred from Digester 3 to the Digested Sludge RDT using one (1) vortex (torque-flow) pump installed in the Digester Control Building basement as part of this project.
 - 7. Digested sludge RDT feed solids concentration: range of 2.50-3.0 percent TSS.
 - 8. VSS/TSS ratio: 65 to 85 percent of total solids.
 - 9. Temperature range: 45 to 90 Deg F.
 - 10. pH range: 6.0 to 8.0.
- B. Water and Polymer Characteristics:
 - 1. Washwater:
 - a. Washwater will be non-potable strained plant effluent water or strained filtrate recycle from the RDT.
 - b. The plant effluent water system is approximately 50 psig. A booster pump shall be supplied by the rotary drum thickener manufacturer and mounted below the RDT unit.
 - c. Washwater pressure will be boosted to the manufacturer recommendation using the washwater booster pump.
 - 2. Polymer solution:
 - a. Polymer will be supplied from polymer manufacturer in 275 gallon totes.
 - b. Polymer will be blended and diluted with plant effluent water using a polymer blending unit. Refer to Section 46 3333 for complete requirements for polymer feeder/blenders.

1.07 WARRANTY

- A. Full warranty against defects in materials and workmanship for two years after substantial completion, including all parts, labor, and expenses.
- B. The thickener manufacturer shall guarantee the performance of the thickening system supplied based on minimum performance requirements described in this specification.
- C. The guarantee shall be in the form of a Performance Bond issued to the Owner.
- D. The Performance Bond will be issued in the amount of 100% of the equipment cost for the thickening system supplied.
- E. If the thickener does not meet the minimum performance requirements described in this specification, the Owner, at his discretion, shall assess a monetary penalty of 100% of the equipment cost for the thickener system supplied if equipment is returned to manufacturer.
- F. A retainage equal to 10 percent of the equipment cost will be withheld by the Owner until after the performance testing. If the thickener meets the minimum performance requirements, the Owner will then pay the amount retained on the general contractor's next partial payment request after successful performance testing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. BDP - 4x10.

2.02 PROJECT CONDITIONS

- A. One (1) rotary drum thickener will thicken polymer conditioned waste activated sludge (WAS) pumped from the WAS Holding Basins to the RDT Building.
- B. WAS characteristics are expected to be 0.30-0.50 percent solids, with all percentages based on dry solids in the sludge feed to the thickening unit.
- C. One (1) rotary drum thickener will thicken polymer conditioned digested sludge pumped from Digester 3 to the RDT Building.
- D. Digested sludge characteristics are expected to be 2.50-3.0 percent solids, with all percentages based on dry solids in the sludge feed to the thickening unit.
- E. Two (2) new polymer feed systems will be available for preparing and feeding a polymer solution.
- F. The rotary drum thickener system shall be suitable for continuous operation with minimal operator attention.

2.03 PERFORMANCE AND DESIGN REQUIREMENTS.

- A. Design Criteria. The rotary drum thickeners will normally be operated for approximately up to 16 hours per day and seven days per week.
 - 1. Each thickening system shall meet or exceed the criteria listed below while thickening the polymer conditioned waste activated sludge or digested sludge, respectively.
 - 2. WAS RDT Hydraulic capacity: Up to 300 gpm at 0.50% solids.
 - 3. Digested Sludge RDT capacity: Up to 67 gpm or 1,000 lb/hr at 3.0% solids
 - 4. Thickened WAS: minimum 5.0 percent solids.
 - 5. Thickened Sludge: minimum 7.0 percent solids.
 - 6. WAS RDT Polymer usage rate: maximum 15 pounds active polymer/dry ton of solids.
 - 7. Digested Sludge RDT Polymer usage rate: maximum 20 pounds active polymer/dry ton of solids.
 - 8. Suspended solids capture rate: minimum 90 percent for the WAS Thickening and minimum 90 percent for Digested Sludge Thickening.
 - 9. Layout configuration: As shown on Contract Drawings.
- B. Design Requirements.
 - 1. The rotary drum thickener shall be a complete thickening unit consisting of, but not limited to, the following main components:
 - a. Structural frame and drum components.
 - b. Screen and screen washing system.
 - c. Solids discharge chutes with sample ports.
 - d. Filtrate collection pan and filtrate effluent discharge piping.
 - e. Floc development tank with upstream mixing valve/injection ring.
 - f. Terminal box and alarm/control panel.
 - g. Washwater booster pump.
 - 2. The rotary drum thickener shall be factory assembled as completely as possible, including piping and wiring, so that a minimum number of external connections are required. Each unit shall be mechanically tested and adjusted prior to shipment from the factory. If disassembly is required the components shall be match-marked to assure that each thickener is reassembled with the same components as when shop tested.
 - 3. The reassembly and installation shall be completed by the combined and coordinated efforts of the installation contractor and qualified representatives of the thickener manufacturer. As a minimum, the qualified representatives shall oversee the procedure and shall assure that the units are properly reassembled.
 - 4. Sludge and polymer shall be mixed in a floc development tank prior to introduction to the rotary drum thickener. The floc tank retention time shall be based on optimum flocculation.

2.04 MATERIALS

- A. All materials shall be of 316 Stainless Steel, unless otherwise noted.

2.05 ROTARY DRUM THICKENER

- A. Main Structural Frame.
1. The main structural frame shall be constructed of welded and/or bolted 316 stainless steel structural shapes.
 2. The maximum deflection of frame members at maximum operating conditions is 0.01 inch.
 3. The construction shall allow for removal of the drum and other elements without disassembly of frame.
 4. Frame shall be installed on prepared foundations with necessary supports.
 5. Appropriate lifting mechanism/tools to permit ready removal of pieces for maintenance or access shall be provided.
- B. Screens.
1. Screens shall be constructed of stainless steel or polyester woven mesh with porosity or percent opening determined by the manufacturer. Mesh may vary with stage. Mesh shall be easily changeable with simple tools.
- C. Effluent Solids Discharge Chute.
1. Effluent solids discharge chute shall be designed to prevent splashing sludge and odor containment.
 2. The effluent solids discharge chute shall be fabricated from minimum 12 gage 316 stainless steel.
 3. The effluent solids discharge chute shall discharge TWAS and thickened sludge, respectfully, into a sludge hopper which will be connected to the downstream sludge pump. Sludge hopper shall be provided by the RDT manufacturer. Refer to Contract Drawings for layout and complete requirements.
 4. Sample ports for solids discharge sampling shall be provided on the effluent solids discharge chute.
 5. The effluent solids discharge chute shall discharge thickened sludge into a sludge hopper which shall be provided by the RDT manufacturer.
- D. Sludge Hopper
1. Two (2) sludge hoppers shall be provided by the RDT manufacturer, one for each RDT, to temporarily hold thickened WAS and thickened sludge prior to downstream pumping.
 2. Each sludge hopper shall be fabricated from minimum 12 -gauge thickness type 316 stainless steel.
 3. Each sludge hopper shall have a sloped bottom and have a minimum working volume of 125 gallons.
 4. RDT manufacturer shall be responsible for coordinating with Contractor to ensure that each sludge hopper is suitable to fit in the space provided.
 5. Each sludge hopper shall include a flushing connection to be used for occasional flushing in the sludge hoppers. Piping from the internal shower bar assembly to the hopper flushing connection, including manual ball valve and stainless steel braided hose, shall be the responsibility of the RDT manufacturer.
- E. Drum Washing System.
1. A drum washing system shall be provided to effectively clean the entire screen.
 2. Water will be supplied from the plant effluent water or filtrate recycle and pumped to the rotary drum thickener by the washwater booster pump system.
 - a. The spray washwater system shall be designed to provide the required water to the rotary drum thickener system and shall be coordinated by the rotary drum thickener manufacturer.

- b. A washwater booster pump shall be provided, suitable for operation with non-potable (plant effluent) water or filtrate recycle and furnished by the rotary drum thickener manufacturer as described in these specifications.
 3. The screen spray assembly shall be comprised of a header pipe equipped with manufacturer's standard low profile spray nozzles.
 4. All metal components of the belt shower assembly shall be constructed of stainless steel.
 5. No spray water or misting shall occur outside the unit.
- F. Washwater and Filtrate Collection Pans.
 1. Drain pans shall be provided to collect all filtrate and wash water drainage. The pans shall be fabricated from 316L stainless steel with a minimum thickness of 14 gage. Bolt holes shall be adequately reinforced to prevent cracking or shear failure. Collection pans shall minimize fugitive spray and mist emissions.
 2. Each drain pan shall be provided with two drain lines to convey filtrate effluent to either the drain or the washwater booster pump suction as identified on Contract Drawings IC.101 and IC.102. The pipe shall be oversized to prevent clogging and shall be provided with cleanouts for rodding. Tees with screw plugs for cleanouts may be provided.
 3. The rotary drum thickener and drain pans shall be designed to contain all sludge, drainage, filtrate, and spray water within the unit.
- G. Drum Drive Unit.
 1. Each rotary drum thickener shall be provided with a variable speed drive unit(s).
 - a. Output speed regulation shall be as required for the manufacturer's rotary drum thickener.
 - b. The drive unit(s) shall be protected by corrosion-resistant coatings as a minimum.
 2. Each motor shall be rated 460 volts, three phase, 60 Hz, totally enclosed fan cooled (TEFC), and corrosion-resistant with insulation systems sealed for moisture and mildew resistance.
 3. Each motor selected for adjustable speed control shall be furnished with at least one automatic reset winding temperature switch per phase. Temperature switch contacts shall be normally closed and rated 5 amperes at 120 volts ac. The contacts shall be wired in series with the end leads brought out to a separate motor terminal box. Switches shall be as recommended by the motor manufacturer.
 4. Motors shall be specifically selected for service with an adjustable frequency type speed controller and shall be derated as required to compensate for harmonic heating effects and reduced self-cooling capability at low speed operation. Each motor shall not exceed a Class B temperature rise when operating in the installed condition at load with power received from the adjustable frequency drive. All motors used with drives shall be supplied with full phase insulation on the end turns and shall meet the requirements of NEMA MG 1, Part 31. In addition to the requirements of NEMA MG 1, Part 31, motors shall be designed to be continually pulsed at the motor terminals with a voltage of 1600 volts ac.
 5. The belt drive shall be capable of varying its output speed from 50 to 150 percent of the speed required for the design conditions, without disassembly.
 6. Lubrication system for the drum bearings shall have zerk fittings.
- H. Floc Development Tank.
 1. Each rotary drum thickener shall have a floc development tank designed to efficiently flocculate sludge with the polymer.
 2. If recommended by the RDT manufacturer, the unit shall use a mixer and impeller to provide the needed energy to produce a water-releasing floc.
 3. The floc tank shall be constructed of a minimum 10 gage 316 stainless steel.
 4. The unit shall be designed to operate without plugging with a sludge containing stringy material.
 5. A single sludge inlet connection shall be provided at the bottom of the floc tank.
 6. Sludge will discharge from the top of the flocculation tank to the rotary drum thickener.
 7. All parts contacting sludge or chemicals shall be Type 316 stainless steel or equivalent corrosion-resistant materials.

8. All parts requiring cleaning, maintenance, or operational adjustments shall be readily accessible.
- I. Provide a flanged connection to RDT enclosure to allow for HVAC connection as shown on drawings. The connection shall be 150 lb flange with size coordinated with HVAC drawings.

2.06 WASHWATER BOOSTER PUMPS

A. General:

1. Each rotary drum thickener shall be provided with a single-stage, centrifugal, end-suction, horizontal, in-line pumping unit, designated as a water booster pump, shall be provided as a part of each rotary drum thickener unit. The rotary drum thickener manufacturer shall be responsible for coordinating the washwater booster pumps and associated valving with each rotary drum thickener.
2. Each pumping unit shall be securely supported and shall be complete with pump, electric motor, and all other appurtenances that are specified or required for proper operation. A spare mechanical seal shall be furnished with each pumping unit.

B. Pumping Units.

1. Pumping units shall be designed to provide sufficient flow at the required head to meet the washwater requirements of each rotary drum thickener.
2. Pump performance shall be stable and free from cavitation and noise throughout the specified operating head range at design suction pressures.

C. Manufacturers

1. Goulds Model 3656

D. Pump Materials.

1. Each pump shall be all bronze, using materials as listed below:
 - a. Casing: Cast iron, ASTM 48, or bronze, ASTM B62.
 - b. Casing Wearing Ring: Cast iron, ASTM 48; or bronze, ASTM B62.
 - c. Impeller: Bronze, ASTM B62.
 - d. Shaft: 303 Stainless steel.
 - e. Shaft Sleeve: Bronze, ASTM B144, Alloy 937; or AISI 416 stainless steel.
 - f. Mechanical Seal: Carbon-Ceramic.
 - g. Base: Cast iron or fabricated steel.
2. Pump shafts shall be completely machined and large enough to hold shaft deflection at the seal to less than 0.002 inch at all operating heads.
3. Each pumping unit shall be provided with lifting eyebolts or lugs, plugged gage cock connections at the suction and discharge flanges, and tapped and plugged openings for casing and bearing housing vents and drains. Flushing water connections to mechanical seals shall be equipped with 25 micron reusable, ceramic filters.

E. Balance.

1. All rotating parts shall be accurately machined and shall be in as nearly perfect rotational balance as practicable. Excessive vibration shall be sufficient cause for rejection of the equipment. The mass of the unit and its distribution shall be such that resonance at normal operating speeds is avoided. In any case, the vibration displacement (peak-to-peak) as measured at any point on the machine shall not exceed 2.0 mils.
2. At any operating speed, the ratio of rotative speed to the critical speed of a unit or components thereof shall be less than 0.8 or more than 1.3.

F. Electric Motors (Washwater Booster Pumps).

1. Motors, including bearings, shall be self-air-cooled and grease or oil lubricated. Motors shall have antifriction bearings with an AFBMA minimum L10 life rating of 40,000 hours when carrying the maximum pump load within the specified operating head range. The motors shall be vertical solid shaft as required.
2. Each motor shall be rated 460 volts, three phase, 60 Hz, totally enclosed fan cooled (TEFC), and corrosion-resistant with insulation systems sealed for moisture and mildew resistance.

3. Bearings shall withstand maximum upthrust from the pump. Bearings shall have overgreasing prevention or oil level indication. Bearings and lubricant identities shall be engraved on nameplates. Motor air gaps shall be treated to resist rust in a moist atmosphere below 20 C. Motor shafts shall be designed for direct pump impeller attachment and rigid impeller support.
 4. If scheduled with VFD, supply with full phase insulation on the end turns and meet the requirements of NEMA MG1-Part 31.
- G. Shop Tests.
1. One pumping unit shall be tested at the factory for capacity, power requirements, and efficiency at specified rated head, shutoff head, operating head extremes, and at as many other points as necessary for accurate performance curve plotting. All tests and test reports shall be made in conformity with the requirements and recommendations of the Hydraulic Institute Standards. A copy of the test reports, including test curves with head, bhp, efficiency, rpm, and NPSHA plotted against capacity, shall be submitted to the ENGINEER. The curves shall be easily read and plotted to scales consistent with performance requirements.
- H. Accessories to washwater booster pumps:
1. Pressure Gauges:
 - a. Pressure gauges shall be furnished as part of a complete factory assembly, including gage, snubber, liquid fill, isolation valve, and threaded type 304 stainless steel interconnecting piping. Gage assemblies shall be furnished with an isolation valve as indicated on the Contract Drawings.
 - b. Manufacturers:
 - 1) Ashcroft.
 - 2) Ametek.
 - 3) Engineer approved equivalent.
 - c. Gauges: Shall meet the requirements of ASME B40.100, UL 393.
 - d. Design:
 - 1) Case and bourdon tube: Type 316 stainless steel case with full-sized Type 316 stainless steel Bourdon tube. Provide with 1/2-inch NPT (minimum)
 - 2) Movement: 300 series stainless steel.
 - 3) Socket: Type 316 stainless steel.
 - 4) Dial: White background with black markings.
 - 5) Window: Clear acrylic or shatterproof glass.
 - 6) Liquid fill with glycerin.
 - 7) Size: 4-1/2 inch diameter.
 - 8) Mid-scale accuracy: One
 - 9) Scale: PSI.
 - 10) Range for non-potable water: 0 to 120 psi.
 2. Strainers for Washwater Booster Pumps:
 - a. Wye strainers shall be provided for the RDT washwater booster pump assemblies as indicated on the Contract Drawings.
- I. Installation.
1. Each pumping unit shall be leveled, aligned, and wedged into position to fit connecting piping. Installation procedures shall be as recommended by the pump manufacturer, the Hydraulic Institute Standards, and as required herein.
 2. Special care shall be taken to maintain alignment of pumping unit components. No stresses shall be transmitted to the pump flanges. After final alignment and bolting, pump connections shall be tested for applied piping stresses by loosening the flange bolts. If any movement or opening of the joints is observed, piping shall be adjusted to proper fit. Shimming between machined surfaces will not be permitted.

2.07 POLYMER INJECTION AND SLUDGE/POLYMER MIX EQUIPMENT

- A. Polymer Flow Distribution Manifold.

1. A manifold shall be provided to split polymer flow from the polymer pump to the polymer injection ring. The manifold shall have one inlet and four outlets. One shall be provided for each rotary drum thickener.
2. All hose fittings shall allow connection to injection ring.
- B. Polymer Injection Rings.
 1. A polymer injection ring shall be mounted upstream of the sludge/polymer mixer as shown on the Drawings. The injection ring shall be a vortex type that will split polymer flow into four feed points around periphery of pipe.
 2. The ring shall be constructed of solid PVC L or UHMW block the same ID and OD of pipe flange.
 3. One polymer injection ring shall be provided per rotary drum thickener.
- C. Sludge/Polymer Mixer.
 1. The sludge/polymer mixer shall be variable orifice type with mixing energy independently adjustable during operation through external weight arm. The mixer shall automatically open to allow solids larger than present opening to pass through the mixer without clogging and return to preset conditions.
 2. The mixer shall also have removable side plates for inspection and cleaning.

2.08 ELECTRICAL.

- A. The Contract Drawings indicate the anticipated electrical power, control, and instrumentation equipment required for a typical rotary drum thickener. The supplier shall be responsible for supplying and installing any additional equipment, cable, conduit, devices, and controls required or recommended by the rotary drum thickener manufacturer for the safe and satisfactory operation and supervision of the rotary drum thickener and related equipment actually provided.
- B. Machine Mounted Estop device with pull cord connection and pushbutton. Quantity two, one each side of machine.
- C. Drum drive zero speed switch.
- D. Level/Pressure transmitters - sludge hopper level, filtrate pan level.
- E. Pressure Switch - RDT washwater booster pump discharge.
- F. Terminal Box.
 1. All 120 volt and below instrumentation and control devices provided with the rotary drum thickener shall be provided prewired to a NEMA Type 4X stainless steel terminal box on the rotary drum thickener assembly. All terminals shall be suitable for the wire sizes indicated on the drawings. All terminals shall be permanently labeled as to device, terminal number, and voltage.
- G. Controls.
 1. Each rotary drum thickener shall be provided with a Rotary Drum Thickener Main Control Panel and the devices specified herein.
 2. Main Control Panel.
 - a. Each rotary drum thickener shall be furnished with a main control panel that shall be a floor-mounted NEMA Type 4X Stainless Steel enclosure and located remote from the unit. The main control panel shall house all electrical equipment and accessory items required in the operation of equipment and its appurtenances.

- b. The main control panel shall have a main circuit breaker disconnect for 480 volt, 3 phase, 60 Hz service for the equipment, branch circuit protection per NEC, and a combination thermal-magnetic motor starter for the spray water pump, exhaust fan, and adjustable frequency drive for drives for the drum drive unit and floc development tank mixer as required by the rotary drum thickener. Control voltage for the motor starters, relays, timers, and auxiliaries shall be 120 volts, single phase from control power transformers in the panel. The control circuit shall have one lead fused and the other grounded. The motor starters shall have three overload relays, one in each phase correctly sized for the motors furnished. The starters shall be provided with an external manually reset pushbutton for reset of the thermal overload relays. The complete starter shall have an interrupting rating of at least 42,000 amperes at 480 volts.
- c. The panel shall be factory tested electrically and pneumatically by the panel fabricator before shipment.
- d. Door Mounted Devices:
 - 1) Main disconnect operator.
 - 2) RDT Drum Drive HOA switch, VFD HIM, and Green Running Pilot Light.
 - 3) Floc Mixer HOA switch, VFD HIM, and Green Running Pilot Light.
 - 4) Wash Pump HOA switch, Overload Reset Pushbutton, and Green Running Pilot Light.
 - 5) Odor Fan HOA switch, Overload Reset Pushbutton, and Green Running Pilot Light.
 - 6) Emergency Stop Pushbutton and Red Indicating Pilot Light.

2.09 MAINTENANCE MATERIALS

- A. Furnish Owner the following extra materials:
 - 1. Rotary drum thickener:
 - a. Screen cloth or screen for one (1) unit.
 - b. One set of any special tools required for maintenance and operation.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions and Section 46 0500, as indicated on drawings, by qualified craftsmen.
- B. Location, orientation, and quantities as indicated on Contract Drawings.
- C. Include all required related items necessary for a complete installation.
- D. Responsible for compatibility of manufacturer's shop coating and final finish.
- E. Support and anchor as shown.

3.02 FIELD QUALITY CONTROL

- A. Performance Testing:
 - 1. The Performance Test (PT) shall be conducted by the thickener supplier to show compliance with minimum performance requirements described in this specification. The Contractor shall furnish all labor, test equipment, and polymer required for the tests. The polymer used for the tests shall be selected by the RDT supplier based on the preliminary testing of representative plant sludge.
 - 2. The PT shall be subject to facility shutdowns and sludge availability.
 - 3. The PT for each thickener shall take place after complete installation.
 - 4. The contractor shall notify the Owner a minimum of one week in advance of PT for each thickener. Contractor shall detail the proposed performance test procedure, schedule, and analyses. Proposed data collection sheets shall be submitted for review. Testing shall not proceed without Engineer's acceptance of the testing procedure and dates.
 - 5. The PT for each thickener shall begin no later than 7:30 AM.
 - 6. The supplier shall take samples under supervision of the Owner and Engineer. Lab analysis will be performed on-site by the Owner.

7. A qualified technical representative of the RDT manufacturer, Owner's personnel, and the Engineer shall be present for the PT testing.
8. Performance Testing Procedures:
 - a. Each thickener shall be operated for eight (8) continuous hours.
 - b. The WAS RDT shall be operated at a max sludge feed rate of 300 gpm and a max of 0.50% feed solids for the duration of the PT. If the inlet total solids concentration is higher, the feed flow rate will be reduced as necessary for the PT.
 - c. The Digested Sludge RDT shall be operated at a max sludge feed rate of 67 gpm and a max of 3.0% feed solids (or 1,000 lb/hr) for the duration of the PT. If the inlet total solids concentration is higher, the feed flow rate will be reduced as necessary to maintain a maximum of 1,000 lb/hr solids loading rate for the PT.
 - d. Sampling and Testing:
 - 1) Thickener manufacturer shall take samples on an hourly basis during the PT. Samples shall be taken a minimum of once per hour. Samples shall be collected within 5 minutes of the end of each operating hour (8 samples total). Samples shall be analyzed for the following parameters:
 - (a) Sludge Feed Total Suspended Solids (TSS)
 - (b) Volatile Suspended Solids (VSS)
 - (c) Total Solids (TS)
 - (d) Filtrate Total Suspended Solids (TSS)
 - (e) Thickened Sludge Total Solids (TS)
 - 2) In addition to the above listed samples and analysis, the thickener manufacturer shall track polymer usage throughout the PT. Polymer usage shall be expressed as pounds active polymer/ton dry solids. Hourly polymer usage rates shall be determined, based on hourly solids throughput and cumulative polymer usage for each hour. The average hourly polymer usage rates will be averaged to determine the overall polymer usage for the PT. Active polymer concentrations shall be determined based on polymer manufacturer's product data (i.e. assumes 100% activation). Thickener manufacturer shall also record flowrates of washwater, polymer solution, and feed sludge at times of sampling for solids analysis.
 - 3) Solids capture shall be calculated using the following equation, based on the hourly samples taken as specified above:
 - (a) Percentage solids capture = $[(C \times (F - E)) / (F \times (C - E))] \times 100$ percent
 - (b) Where: C = Percent TWAS Solids (TS)
 - (c) E = Percent Filtrate Solids (TSS)
 - (d) F = Corrected Percent Feed Solids (TSS)
 - (e) Where F = $[\text{Percent Sludge Solids Concentration (percent TSS)} \times \text{Feed Sludge Flowrate (gpm)}] / [\text{Feed Sludge Flowrate (gpm)} + \text{Washwater Flowrate (gpm)} + \text{Polymer Solution Flowrate (gpm)}]$
 - (f) The solids capture rate shall be calculated on an hourly basis. The eight hourly results shall then be averaged to determine the overall average sludge capture rate during the PT.
 - 4) All sample analyses shall be performed by the Owner.
 - 5) All sample analyses shall be performed in accordance with applicable Standard Methods procedures.
 - 6) The Owner reserves the right to verify, by any means necessary, the results of sampling and analysis performed by the thickener manufacturer.
 - e. After completion of the PT for the thickener, the manufacturer shall prepare a written report containing the following minimum items:
 - 1) Summary of testing details.
 - 2) Testing results.
 - 3) Comparison of test results with minimum performance requirements.
 - 4) Presentation of data and results in tabular/graphical form.

9. The PT for the thickener shall be considered failed if the average thickened waste activated sludge (TWAS) solids concentration is less than the minimum required, if the overall average polymer usage rate is greater than the maximum required, OR if the average suspended solids capture is less than required by this specification.
10. If the thickener system has failed the PT, the manufacturer shall have a minimum of two (2) week to perform, at no expense to the Owner, supplemental testing, equipment adjustments, repairs, etc. and request a retest of the thickener. The supplier shall notify the Owner a minimum of three working days prior to the retest.

END OF SECTION 46 7133

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor and City Council
FROM: Sarah Rosenblum, Library Director
DATE: February 20, 2025
RE: Request to surplus Mobile Outreach Vehicle

Strategic Plan Objective: N/A

Recommendation: That MOBI be declared surplus and be sold to recoup as much value as possible.

Budget Impact: The sole part-time position dedicated to MOBI has been eliminated and funding for gas and maintenance lines also eliminated.

Description/Background: The Marshalltown Public Library will be discontinuing the rollout of MOBI, as it has been determined that this additional service is simply not sustainable in the current budget climate.

Four years ago, when the library started the journey toward the acquisition of a mobile services vehicle, we were in a very different position with the stability of our funding and staffing than we are at this point.

While public use of the library has rebounded to pre-COVID levels, we have had more staffing turn-over and changes in the last several months than in the previous several years including changes that impact workload of current staff. Some examples:

- Retirement of the part-time cataloger, who had returned to catalog after her original retirement, sharing her high-level skill in a part-time role. This position was not replaced, and all cataloging duties have been folded into existing duties in the adult and youth departments.
- The re-purposing of the volunteer coordinator into the outreach coordinator position, which involved folding volunteer management into the current departments.
- The loss of the AmeriCorps/VISTA dedicated summer youth intern—who worked nearly full-time hours from June through the beginning of August, that the library has utilized for the past 5 years. This program has been paused (due to a change in federal funding to Campus Compact that has administers the program) with no indication if it will be available to us in the future. This position was pivotal in adding to our capacity for programs, as well as extremely helpful in supervising and guiding volunteers.

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



Things that have changed that we couldn't have anticipated:

- Legislative action that removed the voter-approved library levy, which had been where the funds for the outreach coordinator position came from.
- Legislative actions that are heavily impacting Cities in Iowa (caps on how much allowable growth Cities may capture, property tax relief measures that take away from the general fund which funds City services).

While these legislative changes could “come around” in different sessions, due to the nature of vehicles and technologies, MOBI will rapidly depreciate in value, while at this early point, we may have an opportunity to recoup much of the original investment.

Costs of MOBI

Vehicle cost

Ongoing maintenance/gas

Outreach Coordinator position

Integrating MOBI materials into the public catalog

Garage (will not be built—saving the Friends \$100,000)

Weather Issues:

MOBI cannot be deployed for Pop-Up libraries in many weather circumstances that are increasingly present: extreme heat, severe cold, windy conditions. Example, this summer, we stopped using MOBI this summer for Bobcat U summer school site visits, and just took outreach totes to use inside, because so many of the days were such extreme heat that kids were not going outside for recess, let alone “hanging out” at a pop-up library.

Indoor Pop-Ups are possible, but for an efficient system, require at least 3 staff for unloading and loading, because one person is operating the lift inside the vehicle, another is outside the vehicle taking the carts off, and a 3rd person is taking those carts into the location specified (often when MOBI is parked quite a way away.)

Staffing Needs for MOBI:

The number of staff required for a stop where people can check out: 2 (outreach coordinator and an experienced person at the PIC level who can check out in circumstances that have more variables than the average in-library check-out) + 2 volunteers to monitor the collection, make sure people don't take items without checking out, help people find items, etc.

The number of staff required for a stop that will be checking out AND issuing library cards: 3 (outreach coordinator and 2 experienced staff people at the PIC level who can check out and issue cards in circumstances that have more variables than the average in-library check-out or card application process) plus 3 volunteers (2 to work with collection as described above and one, preferably bilingual, person to help people fill out the library card application while waiting their turn.)

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An extra person (so 2 people) is needed anytime MOBI is being placed in an area, for safety, as well as until it is loaded up. For example, the lift stopped working halfway through the loading process. Luckily, we were at a location that could allow us to store the unloaded carts inside overnight. One person needed to wait with the vehicle and carts in the parking lot, while the other person went inside to catch the preschool before it closed. Had this not been an option to store the carts, the staff would have likely had to remove the books from carts, lift the carts manually into the vehicle, and manually shut the lift gate doors (which would absolutely take two people.) Another time, MOBI was still being loaded after a school visit—all rest of the activity areas and school staff had left, and a group of kids came onto the blacktop (which normally would not have had any vehicles on it)---so a 2nd person was necessary to help MOBI navigate out of the area safely.

There are many staff hours before and after a deployment to get books ready and loaded, and then unloaded and put away back at the library.

The Good News

- Outreach is not about vehicles—even really awesome ones like MOBI—as much as about staff and connections, one human to another. This will not stop because we no longer have MOBI. While also limited by availability of staff, we will continue outreach to preschools, school family night events, tabling at community events, homebound delivery. In addition, some of the items we purchased to do outreach, like a larger dolly for totes of books, durable (but collapsible) wagons, etc. improved our ability to bring larger and bigger quantities of library items at outreach locations in large quantities, while minimizing the chance of injury to staff. Several instances we thought we'd bring MOBI, we pivoted to loading items into the staff vehicles for an outreach experience.
- Most of the materials that were cataloged to MOBI were taken out of our current collection, or were more copies of our most popular items. These books will just be re-added into the regular collection and just make more copies available
- Many of the systems we created and things we learned and connections we have made in working toward MOBI being deployed have important lessons or benefits that we will continue to utilize in other work.

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MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor and City Council
FROM: Heather Thomas, Public Works Director
DATE: February 24, 2025
RE: Compost Facility

Strategic Plan Objective: The mayor and council indicated during the 2025 Strategic Planning effort that establishing city-owned garbage, composting, and recycling was a top goal of theirs. In the 2023 Strategic Planning efforts, it was noted that programs and services should be reviewed periodically.

Recommendation: Provide direction to city staff on 2025 Compost Season Hours/Days of Operation

Budget Impact: Dependent upon direction provided.

Description/Background: City staff have made an increased effort over the past several compost seasons to operate the facility at a break-even financial standpoint. This has included adjustments to hours of operation and gate fees.

The hours of operations were reduced between the 2022 and 2023 Compost Season.

The hours for the 2023 and 2024 seasons were:

Monday thru Thursday - closed

Friday: 10:00 am - 6:00 pm

Saturday: 9:00 am - 4:00 pm

Sunday: 12:00 pm - 4:00 pm

We are looking for confirmation or direction for days/hours of operation for the 2025 Compost Season. To aid in some of that discussion, I've included information below from the past season (2024 CY) and draft projections as we look to amend FY25 and adopt a FY26 budget. In general, we operate April 1 – December 1, weather dependent. For discussion purposes, let's assume the following:

- 37 weeks in a compost season
- \$11/hr budgeted seasonal wage (max out)
- Every day that we are open, requires 1 hour of staff time above open hours for start-up, shut-down, and paperwork/financial management.
 - For each day added, this would increase staffing expenses \$407 for management costs.
- Every hour that we are open is one hour of seasonal wage.
 - Increase of 1 hr open / week, would result in increased staffing expenses of \$407
 - Increase of 4 hr open / week, would result in increased staffing expenses of \$1,628
 - Increase of 7 hr open / week, would result in increased staffing expenses of \$2,849
 - Increase of 8 hr open / week, would result in increased staffing expenses of \$3,256

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2024 Compost Season Info

For the 2024 Compost Season, we opened on March 29, 2024 and closed on December 8, 2024. The city held a community cleanup day on May 18th where the facility was opened to residents with waived gate fees for incoming material and an estimated \$5,567 of material was accepted at no charge. We also had one special open day on Monday, July 29th, 2024 that stemmed from requests following a wind event.

The city operates our financial budgeting on a Fiscal Year (July 1 – June 30). However, many times when we discuss our compost facility, we talk in terms of a compost season which is generally April – November in a given calendar year. For the 2024 Compost Season, here are some financial stats:

- \$ 83,516.23 in Revenue from Gate Disposal Fees, Compost Sale, and Loading Fees.
- \$ 10,296.27 in Revenue from Investment Interest
- \$ 77,029.08 in Operating Expenses
- \$ 35,000.00 in Capital Equipment Expenses
- Net \$ 18,216.58 Deficit (*pull from cash on hand/fund balance*)

In 2024, we upgraded a piece of equipment at a cost of \$35,000 which would not be a typical annual expense. Our next capital equipment need is shown out in FY 2028, so we are not anticipating any additional capital equipment for the next 3 seasons.

Several statistics of the 2024 Compost season are included at the end of this memo.

Our biggest challenges in 2024 were:

~Staffing –

We operate the gate at the facility with seasonal employees and were a bit light this past year. There were eight days this past season where we needed to staff the facility with full-time staff from the Street Division to be able to keep the facility open. In past years, the starting wage was \$9/hr with a \$0.25/hr raise for each year up to a maximum wage of \$10/hr. The seasonal compost positions are currently posted and available on our website; the wages were increased by \$1/hr with a new range of \$10 - \$11/hr. *In order to perform the necessary tasks that require larger equipment and a higher level of training and safety considerations, we also utilize staff from the Street Division to move/pile the material, assist with large load-out, and process yard waste into compost.*

~Unauthorized Materials / Materials Handling

When material comes in, we sort it out into three main areas: grass & leaves, brush & limbs, and tree trunks/larger limbs. This helps us in being able to process the grass & leaves into compost, have the brush & limbs chipped, and allow residents to cut up the larger tree trunks and limbs for use as firewood. We ask the public to please sort their material in these categories. Disposable bags, twine, wood fences, trees with metal stakes in them, bird houses, etc can cause damage to our equipment and also become a safety concern when operating equipment. When we had chipping/hauling of tree debris this past year, we had a fair amount of unsuitable material that was either unauthorized items or had too much dirt/mud mixed in to be able to be chipped. It took city staff 130 hours of sorting and hauling to a dump site to address.

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DRAFT FY 25 BUDGET AMENDMENT & FY 26 BUDGET REQUEST

One of the reasons we are bringing this item for discussion is it will impact our request for FY25 amendment and FY26 budget request. For all practical purposes, we feel we have the facility set up right now at an annual break even, when not considering capital equipment.

We have a draft budget comparison report attached for the FY 2025 budget amendment request and FY 2026 budget, which would result in the following:

FY25 Starting Fund Balance	\$ 241,394
FY Net Revenue/Expenses	- \$ 40,948
Projected FY25 Ending/FY26 Starting Balance	\$ 200,446
Anticipated FY Net Revenue/Expenses	- \$ 446
Projected Ending FY26 Fund Balance	\$ 200,000

The FY25 deficit is largely due to \$35,000 in capital expenditures as well as having slightly more than a year's worth of material that needed chipped/hailed out.

We have a large capital expenditure in our CIP for FY28 with a current projected cost of \$150,000 related to a compost vibratory screen. The availability of this equipment is difficult for both new and used. New ones of the current size we have would cost more than the \$150k we have shown. Used ones (that are in a reasonably okay & useable condition) are currently available a couple states away for \$120-\$130k. As we get closer to FY28, we will continue to evaluate equipment as no decisions have been made. It would be prudent to also look into what equipment costs to rent and its availability in the area for the limited amount of time it gets used in a year.

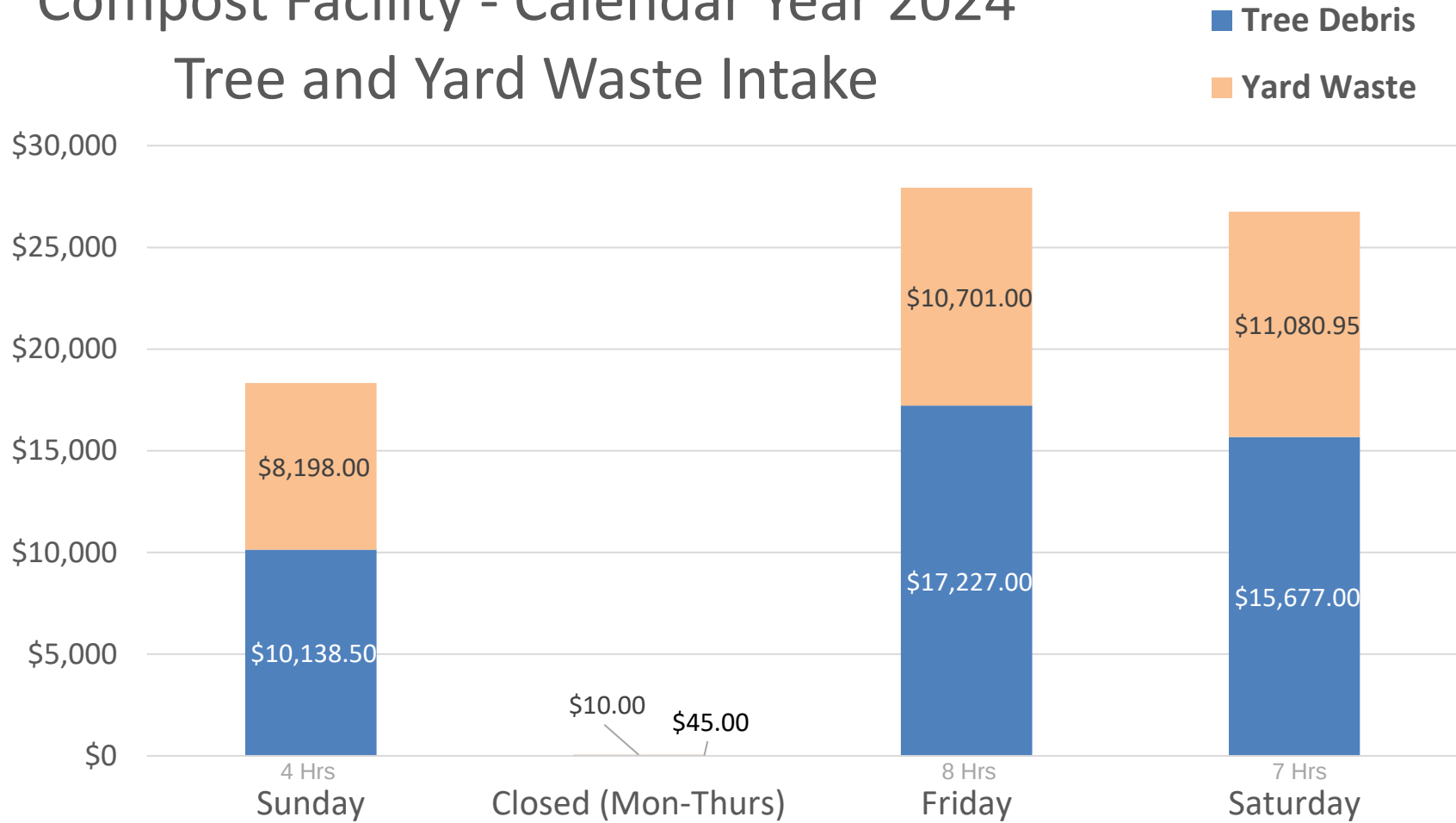
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Compost Facility - Calendar Year 2024

Tree and Yard Waste Intake



**Note, this chart does not include an estimated \$5,567 of tree debris and yard waste that was accepted at no cost on May 18, 2024 as part of the City-Wide Clean-Up Day.*

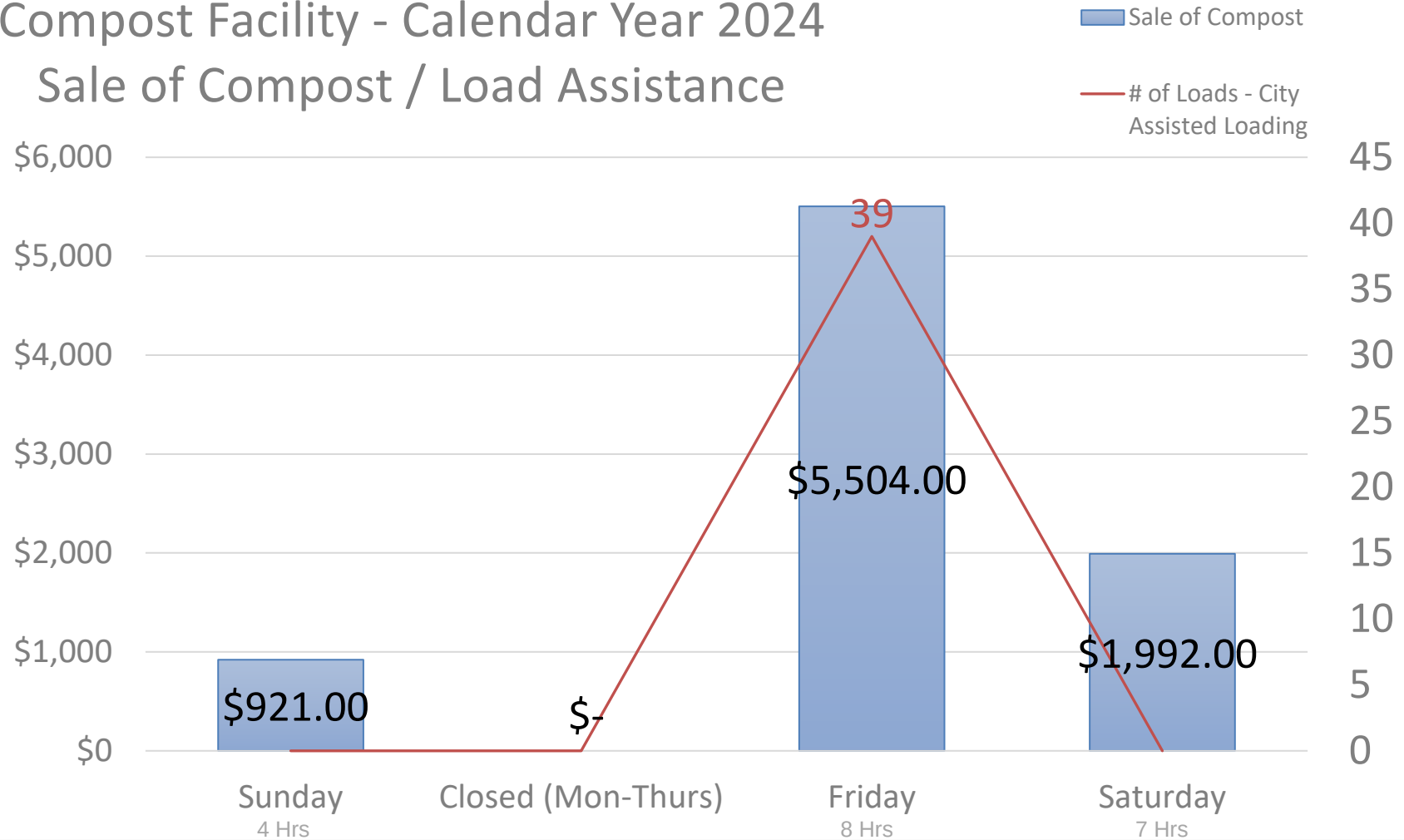
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Compost Facility - Calendar Year 2024

Sale of Compost / Load Assistance



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Below is a summary of some of the statistics on certain comparisons of the last four compost seasons

	<i>Days Gate Fees Did Not Cover Seasonal Staff Wages</i>	<i>Gate, Loading, and Product Fees/Charges</i>	<i>Est. Seasonal Employee Hours</i>	<i>Revenue / Seasonal Hour</i>
<i>CY 2021</i>	<i>12 Days</i>	<i>\$ 98,107</i>	<i>2,225 Hrs</i>	<i>\$ 44.09</i>
<i>CY 2022</i>	<i>36 Days</i>	<i>\$ 83,206</i>	<i>2,220 Hrs</i>	<i>\$ 37.48</i>
<i>CY 2023</i>	<i>0 Days</i>	<i>\$ 80,852</i>	<i>766 Hrs</i>	<i>\$ 105.55</i>
<i>CY 2024 (*See Note A)</i>	<i>1 Day *</i>	<i>\$ 82,274</i>	<i>809 Hrs</i>	<i>\$101.70</i>

Note A:

We struggled with staffing this calendar year and needed to utilize city full time staff on overtime in several circumstances to keep the facility open. The statistics above assume that the facility was staffed with seasonal employees for every day. However, 9 of the days that we were open were staffed with full time street division staff, in many cases on overtime pay.

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				Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
				2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
Account Number	2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Feb				
Fund: 750 - COMPOSTING FACILITY							
Function: 6021 - Finance							
Revenue							
750.6021.4610.000	INTEREST ON INVESTMENTS	9,797.14	800.00	5,424.03	7,000.00	800.00	-6,200.00 -88.57%
	Total Revenue:	9,797.14	800.00	5,424.03	7,000.00	800.00	-6,200.00 -88.57%
	Total Function: 6021 - Finance:	9,797.14	800.00	5,424.03	7,000.00	800.00	-6,200.00 -88.57%
Function: 8070 - Compost							
Revenue							
750.8070.4230.000	MISC BUSINESS LIC/PRMTS	15.00	0.00	0.00	0.00	0.00	0.00 0.00%
750.8070.4481.000	GATE FEE: TREE DISPOSAL	75,981.00	65,000.00	45,297.45	65,000.00	65,000.00	0.00 0.00%
750.8070.4484.000	SALE OF COMPOST BAGS	10.00	0.00	0.00	0.00	0.00	0.00 0.00%
750.8070.4486.000	SALE OF COMPOST	7,191.00	2,500.00	2,933.00	3,500.00	3,500.00	0.00 0.00%
750.8070.4487.000	SALE OF CHIPS/MULCH	80.00	0.00	4.00	4.00	0.00	-4.00 -100.00%
750.8070.4492.000	STREET MISC CHRGS	780.00	1,000.00	160.00	200.00	200.00	0.00 0.00%
750.8070.4616.000	INT CHRGD - ACCTS REC	52.83	0.00	0.00	0.00	0.00	0.00 0.00%
750.8070.4875.000	RFNDS/REIMB: COMPOST	15.61	0.00	45.67	46.00	0.00	-46.00 -100.00%
	Total Revenue:	84,125.44	68,500.00	48,440.12	68,750.00	68,700.00	-50.00 -0.07%
Expense							
750.8070.5010.010	REGULAR-NON UNION	264.39	0.00	98.97	0.00	0.00	0.00 0.00%
750.8070.5010.040	REGULAR-PPME UNION	8,647.65	10,000.00	13,344.05	15,400.00	10,000.00	-5,400.00 -35.06%
Budget Notes							
Budget Code	Subject	Description					
FY25 Amendment 1 Dpt	FY25	extra staff needed, est 130 hrs to assist with haul-out of material that was not able to be composted/chipped, added 50 hrs to help cover gate attendance when seasonal staff were not available in Fall 2024					
750.8070.5030.070	PART-TIME TEMPORARY	7,752.00	9,460.00	4,832.50	9,460.00	9,460.00	0.00 0.00%
750.8070.5101.010	SOCIAL SECURITY-NON UNION	15.41	0.00	5.79	0.00	0.00	0.00 0.00%
750.8070.5101.040	SOCIAL SECURITY-PPME UNION	510.52	620.00	794.95	955.00	620.00	-335.00 -35.08%
750.8070.5101.070	SOCIAL SECURITY-PT TEMP	480.62	587.00	299.65	587.00	587.00	0.00 0.00%
750.8070.5102.010	MEDICARE-NON UNION	3.60	0.00	1.35	0.00	0.00	0.00 0.00%
750.8070.5102.040	MEDICARE-PPME UNION	119.39	145.00	185.91	224.00	145.00	-79.00 -35.27%
750.8070.5102.070	MEDICARE-TEMPORARY	112.48	137.00	70.09	137.00	137.00	0.00 0.00%
750.8070.5111.010	IPERS-NON UNION	24.96	0.00	9.34	0.00	0.00	0.00 0.00%

**Additional Wage
& Benefit Modifications
Are Anticipated**

Budget Comparison Report

						Comparison 1 Budget	Comparison 1 to Parent Budget	%
		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Feb	Parent Budget 2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
Account Number								
750.8070.5111.040	IPERS-PPME UNION	816.34	944.00	1,259.64	1,454.00	944.00	-510.00	-35.08%
750.8070.5111.070	IPERS-PT TEMP	0.00	0.00	12.74	0.00	0.00	0.00	0.00%
750.8070.5121.010	GRP INSUR-NON UNION	45.12	0.00	16.05	0.00	0.00	0.00	0.00%
750.8070.5121.040	GRP INSUR-PPME UNION	1,776.85	1,500.00	2,109.23	2,310.00	0.00	-2,310.00	-100.00%
750.8070.5123.010	WORKCOMP-NON UNION	5.31	0.00	1.78	0.00	0.00	0.00	0.00%
750.8070.5123.040	WORKCOMP-PPME UNION	483.38	569.00	651.28	786.00	510.00	-276.00	-35.11%
750.8070.5123.070	WORKCOMP-TEMPORARY	161.18	190.00	86.73	170.00	170.00	0.00	0.00%
750.8070.5210.000	ADVERTISING & LEGAL PUB	189.96	250.00	0.00	250.00	250.00	0.00	0.00%
750.8070.5216.000	BACKGROUND CHECKS	91.00	75.00	38.00	100.00	100.00	0.00	0.00%
750.8070.5261.000	RESIDENTIAL CLEANUP	1,680.00	0.00	0.00	0.00	0.00	0.00	0.00%
750.8070.5290.000	INSURANCE - GENERAL	51.08	56.00	0.00	56.00	62.00	6.00	10.71%
750.8070.5300.000	INSURANCE - TORT LIAB	216.04	579.00	0.00	238.00	261.00	23.00	9.66%
750.8070.5342.000	CONTRACT-OUTSIDE HELP	540.00	60,000.00	35,990.60	40,000.00	42,000.00	2,000.00	5.00%
Budget Notes								
Budget Code	Subject			Description				
FY25 Amendment 1 Dpt	inc			late summer 24 chipping/hauling. (less than normal as street crew spent 130 hours hauling out non chippable material), non-grind disposal, and dumpster fees				
FY26 Dept Request	inc			Estimate Chipping/Hauling for 1 Year + Dumpster Costs				
750.8070.5344.000	CONTRACT-MAINTENANCE	346.90	600.00	275.35	600.00	600.00	0.00	0.00%
750.8070.5380.000	RENTS & LEASES	0.00	0.00	16.00	16.00	0.00	-16.00	-100.00%
750.8070.5410.000	REPAIRS & MAINTENANCE	2,580.12	200.00	61.88	200.00	200.00	0.00	0.00%
750.8070.5450.000	TELEPHONE/OTHR COMMNCTI	520.92	450.00	91.00	450.00	450.00	0.00	0.00%
750.8070.5481.000	ELECTRICITY	1,041.90	1,400.00	593.84	1,400.00	1,400.00	0.00	0.00%
750.8070.5565.000	VEHICLE OPER/MAINT SPPLY	522.50	50.00	5,045.50	5,055.00	1,000.00	-4,055.00	-80.22%
Budget Notes								
Budget Code	Subject			Description				
FY25 Amendment 1 Dpt	inc			turner repair wheel loader tire repair				
750.8070.5600.000	OPERATING SUPPLIES	3,998.05	250.00	730.17	750.00	750.00	0.00	0.00%
Budget Notes								
Budget Code	Subject			Description				
FY25 Amendment 1 Dpt	inc			Culvert material for replacement				
750.8070.5605.000	OFFICE SUPPLIES	59.98	300.00	1,019.51	1,100.00	300.00	-800.00	-72.73%
Budget Notes								
Budget Code	Subject			Description				
FY25 Amendment 1 Dpt	inc			reorder of compost receipt packet (not annual)				
750.8070.5611.000	BLD.GRD, OPER SUPPLIES	780.15	0.00	0.00	0.00	0.00	0.00	0.00%

Budget Comparison Report

					Comparison 1	Comparison 1		
		2023-2024	2024-2025	2024-2025	Parent Budget	Budget	to Parent	%
Account Number		Total Activity	Total Budget	YTD Activity Through Feb	2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
750.8070.5750.000	OTHER CAP EQUIP > \$5,000	19,000.00	0.00	35,000.00	35,000.00	0.00	-35,000.00	-100.00%
Budget Notes								
Budget Code	Subject	Description						
FY25 Amendment 1 Dpt	CIP	33% of Skid Steer						
750.8070.5990.000	CASH SHORT & (OVER)	-61.00	0.00	40.45	0.00	0.00	0.00	0.00%
Total Expense:		52,776.80	88,362.00	102,682.35	116,698.00	69,946.00	-46,752.00	-40.06%
Total Function: 8070 - Compost:		31,348.64	-19,862.00	-54,242.23	-47,948.00	-1,246.00	46,702.00	-97.40%
Function: 9000 - 9000								
Expense								
750.9000.7500.884	TRANSFER OUT - GROUP HEALTH	250.00	0.00	0.00	0.00	0.00	0.00	0.00%
Total Expense:		250.00	0.00	0.00	0.00	0.00	0.00	0.00%
Total Function: 9000 - 9000:		250.00	0.00	0.00	0.00	0.00	0.00	0.00%
Total Fund: 750 - COMPOSTING FACILITY:		40,895.78	-19,062.00	-48,818.20	-40,948.00	-446.00	40,502.00	-98.91%
Report Total:		40,895.78	-19,062.00	-48,818.20	-40,948.00	-446.00	40,502.00	-98.91%

	2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Feb	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
				2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
Fund							
750 - COMPOSTING FACILITY	40,895.78	-19,062.00	-48,818.20	-40,948.00	-446.00	40,502.00	-98.91%
Report Total:	40,895.78	-19,062.00	-48,818.20	-40,948.00	-446.00	40,502.00	-98.91%

Draft

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Carol Webb, City Administrator
24 North Center Street
Marshalltown, IA 50158
PH 641.754.5701 | FX 641.754.5717

TO: Mayor Greer and City Council
FROM: Diana Steiner, Finance Director
Carol Webb, City Administrator
DATE: 2/19/2025
RE: General Fund FY26 Budget

Strategic Plan:

- ☐ Strategy 1: Expand and improve development in the community.
- ☐ Strategy 2: Enhance Marshalltown's public image.
- ☒ Strategy 3: Continually improve and sustain the City's infrastructure, organization, and services.
- ☐ Strategy 4: Partner with citizens, for-profit, non-profit, and others to improve quality of life.

Plan Objective: N/A

Recommendation: Final discussion on the General Fund 001 FY26 budget, which is the operating budget funded by property taxes, hotel/motel tax, user fees, etc. Staff is seeking direction from Council on a few remaining items related to balancing the general fund budget.

Budget Impact: The budget that is approved gives the City the authority to spend

Description/Background:

The City Council discussed the General Fund 001 FY26 budget at its January 20, 2025 City Council meeting. At that meeting, City staff presented several options for increasing revenue and/or reducing expenses. Staff was directed to implement the following:

1. Eliminate utility fees for general government services
2. Cease the fire inspection contract and perform fire inspections with City staff
3. Hire the Fire Deputy Chief in FY25 and not wait until January 2026.
4. Implement voluntary furlough days
5. Move funding for the AXON body cameras from the General Fund to the ATE fund
6. Account for two vacant police officer positions in FY2026.
7. Transfer Council-designated LOST funds to balance the FY26 general fund budget

After implementing the first five recommendations, the FY26 general fund budget shortfall was reduced from \$1,361,819 to \$1,076,145, which will be transferred from Council-designated LOST funds to balance the budget.

City Council also directed staff to follow up on a few items, including:

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1. Evaluate the impact to the Chamber of Commerce's marketing and tourism budget if the City reduced the percentage of hotel/motel tax provided to the Chamber for these services. Under Iowa Code, if you have a hotel/motel tax, 50% must be used for improving recreational, cultural or entertainment facilities or for promotion of tourist/convention business.

After conversations with Chamber staff, City staff has revised its estimate for hotel/motel tax revenue to \$625,000 for FY26. The table below indicates the history of payments to the Chamber and includes an estimate of the impact of reducing the percentage of hotel/motel tax the Chamber receives from 56% to 50%. As you can see from the chart below, even though the percentage was lowered in FY2023 from 67% to 56% the actual dollars remitted to the Chamber was nearly the same.

Hotel/Motel Tax		Payments to Chamber			
Fiscal Year	Total Revenues	67% CVB	Increase/Decrease		
2018	\$ 403,409.52	\$ 270,284.38			Derecho Aug 2020 (FY21)
2019	\$ 567,753.27	\$ 380,394.69	\$ 110,110.31		Tornado July 2018 (FY19)
2020	\$ 488,482.22	\$ 327,284.43	\$ (53,110.26)	COVID	
2021	\$ 370,562.22	\$ 248,276.69	\$ (79,007.74)	COVID	
2022	\$ 486,551.89	\$ 325,989.77	\$ 77,713.08		
		56% CVB			
2023	\$ 578,743.00	\$ 324,095.73	\$ (1,894.04)		
2024	\$ 581,269.56	\$ 325,510.95	\$ 1,415.22		
2025 (estimated)	\$ 650,000.00	\$ 364,000.00	\$ 38,489.05		
2026 (estimated)	\$ 625,000.00	\$ 350,000.00	\$ (14,000.00)		
		50% CVB			
2026 (estimated)	\$ 625,000.00	\$ 312,500.00	\$ (13,010.95)	Decrease over 2024 actuals	
2026 (estimated)	\$ 625,000.00	\$ 312,500.00	\$ (51,500.00)	Decrease over 2025 estimated	
2026 (estimated)	\$ 625,000.00	\$ 312,500.00	\$ (37,500.00)	Decrease over 56% 2026 estimated	

1. Analysis of the budget impact to increasing fees or reducing hours at the Aquatic Center.

Recreation Supervisor Jenni Hart provided the analysis below:

	Aquatic Center staffing costs per hour	\$ 307.00	
	Savings based on 12 weeks of operation		
	Closing Monday through Friday at 6pm	\$ 18,420.00	\$307 per hour x 5 days = \$1535 per week x 12 weeks = \$18,420
	No Longer offering Evening Waterwalking	\$ 6,900.00	\$115 per day x 5 days = \$575 per week x 12 weeks = \$6,900
	Increasing Daily Admission Fees from \$5 to \$6	\$ 11,216.00	Estimated revenue based on last four years admission counts
	Increasing Evening Water Walking Fees from \$5 to \$6	\$ 1,404.00	Estimate revenue based on last four years admission counts

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Direction Sought:

Does City Council want to reduce the percentage of hotel/motel tax provided to the Chamber?

Does City Council want to reduce hours and/or increase fees at the Aquatic Center?

Does City Council want staff to review any other areas of the general fund?

CITY COUNCIL

Melisa Fonseca, Barry Kell, Mike Ladehoff,
Mark Mitchell, Greg Nichols, Jeff Schneider, Gary Thompson



GENERAL FUND 001

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
Fund: 001 - GENERAL FUND								
Revenue								
001.1010.4292.000	BIKE LICENSE/REGISTRATN	57.00	100.00	66.00	100.00	100.00	0.00	0.00%
001.1010.4326.000	STATE REIMB- IVH POLICE	39,147.00	39,147.00	39,147.00	39,147.00	39,147.00	0.00	0.00%
001.1010.4330.000	STATE OPER GRANT	300.00	2,775.00	300.00	2,775.00	2,775.00	0.00	0.00%
001.1010.4410.000	POLICE SERVICES	9,637.01	7,000.00	4,005.91	7,000.00	7,000.00	0.00	0.00%
001.1010.4411.000	POLICE SECURITY SERVICES	15,520.00	12,000.00	10,780.00	12,000.00	12,000.00	0.00	0.00%
001.1010.4412.000	Police - False Alarm	2,909.40	3,000.00	2,571.00	3,000.00	3,000.00	0.00	0.00%
001.1010.4498.000	Police - Towing Admin Fee	0.00	500.00	50.00	500.00	500.00	0.00	0.00%
001.1010.4510.000	COURT FINES	18,052.79	20,000.00	2,728.08	20,000.00	20,000.00	0.00	0.00%
001.1010.4515.000	COURT ORDERED-RESTITUTION	19,855.69	4,000.00	12,653.03	16,000.00	4,000.00	-12,000.00	-75.00%
001.1010.4616.000	INT CHRGD - ACCTS REC	229.59	0.00	306.96	400.00	0.00	-400.00	-100.00%
001.1010.4875.000	RFNDS/REIMB: POLICE	16,801.56	4,000.00	21,610.35	22,000.00	4,000.00	-18,000.00	-81.82%
001.1010.4876.000	MISC REV: POLICE	0.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.1010.4879.000	REBATES	43.89	0.00	0.00	0.00	0.00	0.00	0.00%
001.1011.4410.000	Police Services ATE	662,004.00	800,000.00	0.00	0.00	0.00	0.00	0.00%
001.1050.4278.000	FIRE PERMITS & CONTRACTED	18,418.32	30,000.00	10,405.17	30,000.00	30,000.00	0.00	0.00%
001.1050.4326.000	STATE REIM - IVH & FIRE MARS	56,874.82	58,158.00	63,640.00	63,640.00	58,158.00	-5,482.00	-8.61%
001.1050.4414.000	FIRE SERVICES/TESTING/INSPEI	31,649.51	30,000.00	15,305.07	30,000.00	30,000.00	0.00	0.00%
001.1050.4415.000	FIRE-LEAD TESTING/INSPECTN	10.00	0.00	10.00	10.00	0.00	-10.00	-100.00%
001.1050.4416.000	FIRE-PLAN REV FEES	880.00	1,500.00	230.00	1,500.00	1,500.00	0.00	0.00%
001.1050.4492.000	FIRE MISC CHRGS	0.00	200.00	10.00	200.00	200.00	0.00	0.00%
001.1050.4499.000	FIRE- ILLEGAL BURNING	0.00	750.00	0.00	2,000.00	750.00	-1,250.00	-62.50%
001.1050.4616.000	INT CHRGD - ACCTS REC	1,604.24	0.00	952.53	1,000.00	0.00	-1,000.00	-100.00%
001.1050.4875.000	RFNDS/REIMB: FIRE	6,760.88	0.00	822.38	823.00	50.00	-773.00	-93.92%
001.1050.4879.000	REBATES	36.79	0.00	48.71	49.00	0.00	-49.00	-100.00%
001.1070.4231.000	HSNG - Demolition Permit	0.00	0.00	100.00	0.00	0.00	0.00	0.00%
001.1070.4261.000	BUILDING PERMITS	152,163.55	175,000.00	53,282.00	155,000.00	155,000.00	0.00	0.00%
001.1070.4262.000	ELECTRICAL PERMITS	26,019.00	30,000.00	12,872.00	26,000.00	26,000.00	0.00	0.00%
001.1070.4263.000	MECHANICAL & GAS PERMITS	18,633.73	10,000.00	12,132.56	19,000.00	19,000.00	0.00	0.00%
001.1070.4264.000	PLAN REVIEW FEES	14,901.90	60,000.00	969.00	30,000.00	30,000.00	0.00	0.00%
001.1070.4265.000	PLUMBING PERMITS	10,713.34	10,000.00	6,981.00	10,000.00	10,000.00	0.00	0.00%
001.1070.4266.000	DEMOL,MOVING,ENCROACHM	425.00	200.00	200.00	200.00	200.00	0.00	0.00%

Budget Comparison Report

						Comparison 1	Comparison 1	
				Parent Budget		Budget	to Parent	%
		2023-2024	2024-2025	2024-2025	2024-2025	2025-2026	Increase /	
Account Number		Total Activity	Total Budget	YTD Activity Through Jan	FY25 Amendm...	FY26 Dept Request	(Decrease)	
001.1070.4616.000	INT CHRGD - ACCTS REC	27.62	0.00	3.62	0.00	0.00	0.00	0.00%
001.1070.4875.000	RFNDS/REIMB: BUILDING	15.61	0.00	1.15	0.00	0.00	0.00	0.00%
001.1071.4420.000	RENTAL HOUSING INSPECTION	71,840.00	150,000.00	43,220.00	100,000.00	100,000.00	0.00	0.00%
001.1071.4421.000	REGISTRATION FEES/RENTALS	51,065.08	50,865.00	51,294.23	52,000.00	52,000.00	0.00	0.00%
001.1071.4422.000	RENTAL APPLICATION FEE	9,480.00	2,000.00	5,970.00	10,000.00	10,000.00	0.00	0.00%
001.1071.4616.000	INT CHRGE - ACCS REC	8,208.90	2,000.00	5,669.70	6,000.00	5,000.00	-1,000.00	-16.67%
001.1071.4875.000	RFNDS/REIMB:	15.61	200.00	12.72	200.00	200.00	0.00	0.00%
001.1072.4251.000	ELECTRICIAN LICENSES	840.00	1,000.00	470.00	470.00	200.00	-270.00	-57.45%
001.1072.4616.000	INT CHRGD - ACCTS REC	226.90	0.00	60.25	40.00	0.00	-40.00	-100.00%
001.1075.4419.000	CODE ENFORCEMENT FEES	1,000.00	0.00	900.00	800.00	0.00	-800.00	-100.00%
001.1075.4492.000	NUISANCE MISC CHRGS	19,274.99	25,000.00	25,259.28	50,000.00	50,000.00	0.00	0.00%
001.1075.4875.000	RFNDS/REIMB: NUISANCE	30.24	0.00	29.68	30.00	0.00	-30.00	-100.00%
001.1099.4620.000	RENTS - Police/Fire Building	4.00	1.00	1.00	1.00	1.00	0.00	0.00%
001.1099.4875.000	RFNDS/REIMB	91.88	16,545.00	10,285.12	16,545.00	16,545.00	0.00	0.00%
001.2010.4325.000	STATE PRIMARY ROAD EXTENS	44,215.71	0.00	0.00	0.00	0.00	0.00	0.00%
001.2010.4616.000	INT CHRGD - ACCTS REC	19.39	10.00	0.00	10.00	10.00	0.00	0.00%
001.2010.4875.000	RFNDS/REIMB: STREETS	-1,350.21	0.00	0.00	0.00	0.00	0.00	0.00%
001.2011.4616.000	INT CHRGD - ACCTS REC	1.02	0.00	0.00	0.00	0.00	0.00	0.00%
001.2020.4492.000	MISC CHARGES	1,794.46	600.00	1,567.80	1,680.00	1,680.00	0.00	0.00%
001.2020.4520.000	ADM - Parking Violations	77,115.37	75,000.00	66,482.64	100,000.00	100,000.00	0.00	0.00%
001.2020.4620.000	ADM - Parking Lease	600.00	0.00	600.00	600.00	0.00	-600.00	-100.00%
001.2020.4875.000	RFNDS/REIMB:PARKING	-44.17	0.00	44.17	45.00	0.00	-45.00	-100.00%
001.2040.4875.000	REFND/REIMB: T SIGNALS	-2,026.33	0.00	0.00	0.00	0.00	0.00	0.00%
001.2060.4232.000	MISCELLANEOUS PERMITS	500.00	250.00	0.00	250.00	250.00	0.00	0.00%
001.2060.4267.000	STREET EXCVN/CURB CUT	2,100.00	1,200.00	1,565.85	2,000.00	2,000.00	0.00	0.00%
001.2060.4270.000	EXCAVATION PERMITS	20,494.06	10,000.00	163,755.94	210,000.00	20,000.00	-190,000.00	-90.48%
001.2060.4272.000	INSPECTION FEE	4,295.00	2,000.00	2,403.00	3,000.00	3,000.00	0.00	0.00%
001.2060.4275.000	NON STANDARD DRIVEWAY FE	36.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.2060.4276.000	DRIVEWAY PERMIT	6,063.00	3,000.00	2,254.00	3,000.00	3,000.00	0.00	0.00%
001.2060.4491.000	MAPS/BUE PRTS/SALES/CHRG	1.00	0.00	6.00	0.00	0.00	0.00	0.00%
001.2060.4492.000	ENGIN MISC CHRGS	9,680.00	9,200.00	16,677.00	19,176.00	19,176.00	0.00	0.00%
001.2060.4616.000	INT CHRGD - ACCTS REC	106.00	0.00	26.78	14.00	0.00	-14.00	-100.00%
001.2060.4875.000	REFND/REIMB: ENGIN	0.00	0.00	360.00	360.00	0.00	-360.00	-100.00%
001.2080.4453.000	AIRPORT SERVICES & USES	9,267.60	7,500.00	5,881.56	8,000.00	8,000.00	0.00	0.00%
001.2080.4492.000	AIRPORT MISC CHRGS	2,500.00	1,000.00	500.00	1,000.00	1,000.00	0.00	0.00%
001.2080.4622.000	ADM - Rent - Farm - Airport	25,992.53	23,442.00	5,663.22	25,632.00	20,526.00	-5,106.00	-19.92%
001.2080.4623.000	AIRPORT RENTAL	26,213.00	28,000.00	16,681.00	28,000.00	28,000.00	0.00	0.00%
001.2080.4875.000	RFNDS/REIMB: AIRPORT	146.00	0.00	7.05	616.00	1,580.00	964.00	156.49%
001.2090.4277.000	GARBAGE LICENSES	100.00	0.00	0.00	0.00	400.00	400.00	0.00%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.2090.4446.000	SOLID WASTE FEES	149,386.49	150,000.00	85,686.53	150,000.00	150,000.00	0.00	0.00%
001.2900.4616.000	INT CHRGD - ACCTS REC	37.27	0.00	4.95	5.00	0.00	-5.00	-100.00%
001.4010.4011.000	DELIQUENT PROPERTY TAXES	22.23	0.00	42.38	0.00	0.00	0.00	0.00%
001.4010.4040.000	PROPERTY TAXES CURRENT LIB	214,693.52	0.00	1,689.14	0.00	0.00	0.00	0.00%
001.4010.4110.000	UTILITY EXCISE TAX	27,032.11	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.4150.000	CURRENT MOBILE HOME TAXE	206.83	0.00	5.35	0.00	0.00	0.00	0.00%
001.4010.4151.000	DELIQ MOBILE HOME TAXES	25.07	0.00	1.34	0.00	0.00	0.00	0.00%
001.4010.4330.000	STATE OPER GRANT	14,808.80	14,932.00	14,789.46	14,932.00	14,932.00	0.00	0.00%
001.4010.4332.000	AGED INCOME CREDIT	196.95	0.00	166.38	0.00	0.00	0.00	0.00%
001.4010.4333.000	DISABLED HOMESTEAD CREDIT	651.26	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.4335.000	HOMESTEAD CREDIT	7,113.40	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.4336.000	MILITARY CREDIT	76.63	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.4337.000	MOBILE HOME CREDIT	0.00	0.00	0.49	0.00	0.00	0.00	0.00%
001.4010.4338.000	BUSINESS PROP TAX CREDIT	7,058.04	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.4339.000	SF295 BACKFILL	4,853.90	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.4350.000	LOCAL/COUNTY GRANTS	41,911.00	41,686.00	225.00	41,686.00	41,686.00	0.00	0.00%
001.4010.4493.000	LIBRARY BOOK CHRGS	4,116.32	3,300.00	2,972.49	5,000.00	5,000.00	0.00	0.00%
001.4010.4550.000	LIBRARY FINES	788.44	500.00	392.31	500.00	500.00	0.00	0.00%
001.4010.4875.000	RFNDS/REIMB: LIBRARY	1,922.26	100.00	374.83	375.00	100.00	-275.00	-73.33%
001.4010.4876.000	MISC REV	8,735.22	7,800.00	5,393.01	7,800.00	7,800.00	0.00	0.00%
001.4030.4472.000	PARK FEES & RENTALS	73,656.38	74,000.00	58,453.16	74,000.00	74,000.00	0.00	0.00%
001.4030.4875.000	RFNDS/REIMB: P&R	3,064.81	1,000.00	329.17	1,000.00	1,000.00	0.00	0.00%
001.4030.4879.000	REBATES	8.86	0.00	0.00	0.00	0.00	0.00	0.00%
001.4030.4960.000	SALE OF F.A.-PARKS	0.00	200.00	222.22	222.00	200.00	-22.00	-9.91%
001.4040.4470.000	GIFT CERTIFICATES	1,405.00	250.00	320.00	500.00	250.00	-250.00	-50.00%
001.4040.4472.000	PARK FEES & RENTALS	5.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.4040.4473.000	RECREATION FEES	17,467.46	15,000.00	11,054.79	15,000.00	15,000.00	0.00	0.00%
001.4040.4875.000	P&R REFUNDS & REIMBURSME	65.73	1,000.00	4.64	1,000.00	1,000.00	0.00	0.00%
001.4041.4350.000	LOCAL/COUNTY - COMM SCHC	75,114.40	65,000.00	37,023.45	70,000.00	70,000.00	0.00	0.00%
001.4041.4479.000	YOUTH REC FEES	134,604.23	180,000.00	85,278.79	150,000.00	150,000.00	0.00	0.00%
001.4041.4875.000	RFNDS/REIMB	-31.84	0.00	343.14	345.00	0.00	-345.00	-100.00%
001.4045.4474.002	AQUATIC CTR FEES, DAILY	81,507.36	70,000.00	53,641.92	90,000.00	90,000.00	0.00	0.00%
001.4045.4474.004	AQUATIC POOL PASS	16,260.45	15,000.00	484.37	15,000.00	15,000.00	0.00	0.00%
001.4045.4474.005	AQUATIC SCAN CARD	5,123.00	6,000.00	1,840.00	6,000.00	6,000.00	0.00	0.00%
001.4045.4474.006	AQUATIC SWIM TICKETS	5,100.34	4,000.00	810.68	4,000.00	4,000.00	0.00	0.00%
001.4045.4474.008	SWIMMING LESSON FEES	6,806.57	10,000.00	3,933.35	10,000.00	10,000.00	0.00	0.00%
001.4045.4474.009	AQUATIC POOL RENTALS	0.00	0.00	934.58	2,000.00	0.00	-2,000.00	-100.00%
001.4045.4875.000	RFNDS/REIMB: POOLS	62.69	100.00	161.16	160.00	100.00	-60.00	-37.50%
001.4045.4876.000	MISC REV: POOLS	-78.46	0.00	6.54	10.00	0.00	-10.00	-100.00%

Budget Comparison Report

Account Number		Comparison 1						
		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Budget	to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.4065.4472.000	FEES & RENTALS	31,051.56	25,000.00	16,815.93	30,000.00	30,000.00	0.00	0.00%
001.4065.4875.000	RFNDS/REIMB: COLISEUM	5,725.53	1,000.00	141.19	1,000.00	1,000.00	0.00	0.00%
001.4066.4483.000	CONCESSIONS	42,656.84	40,000.00	33,754.25	40,000.00	40,000.00	0.00	0.00%
001.4066.4875.000	RFNDS/REIMB	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.5010.4875.000	REFUNDS	0.00	0.00	4.24	5.00	0.00	-5.00	-100.00%
001.5040.4230.000	MISC BUSINESS LIC/PRMTS	1,000.00	0.00	200.00	200.00	0.00	-200.00	-100.00%
001.5040.4231.000	ZONING LIC/PERMITS	7,959.12	6,000.00	3,629.13	6,000.00	6,000.00	0.00	0.00%
001.5040.4616.000	INT CHRGD - ACCTS REC	3.00	0.00	2.25	0.00	0.00	0.00	0.00%
001.5040.4875.000	RFNDS/REIMB	0.06	0.00	5.60	10.00	0.00	-10.00	-100.00%
001.5900.4620.000	RENTS	1,875.00	2,300.00	1,700.00	2,300.00	2,300.00	0.00	0.00%
001.6010.4875.000	REFND/REIMB: MAYOR	15.61	0.00	7.32	10.00	0.00	-10.00	-100.00%
001.6012.4875.000	REFND/REIMB: C.A.	15.61	0.00	51.57	52.00	0.00	-52.00	-100.00%
001.6020.4212.000	LIQUOR LICENSES	52,352.25	32,000.00	15,749.38	32,000.00	32,000.00	0.00	0.00%
001.6020.4220.000	CIGARETTE PERMITS	3,100.00	3,100.00	0.00	3,100.00	3,100.00	0.00	0.00%
001.6020.4230.000	MISC BUSINESS LIC/PRMTS	7,200.00	5,000.00	6,695.00	6,800.00	5,000.00	-1,800.00	-26.47%
001.6020.4492.000	CITY CLERK MISC CHRGS	2,748.22	4,500.00	4,199.25	4,500.00	4,500.00	0.00	0.00%
001.6020.4616.000	INT CHRGD - ACCTS REC	2,040.74	2,000.00	3,410.00	3,500.00	2,000.00	-1,500.00	-42.86%
001.6020.4875.000	REFND/REIMB: CLERK	24.61	0.00	101.33	100.00	0.00	-100.00	-100.00%
001.6021.4010.000	PROPERTY TAXES-CURRENT	6,440,775.90	7,680,226.00	4,125,810.42	7,680,226.00	7,856,876.00	176,650.00	2.30%
001.6021.4011.000	DELINQUENT PROPERTY TAXES	732.40	0.00	2,385.41	0.00	0.00	0.00	0.00%
001.6021.4012.000	PROP TAXES - BAND	7,744.97	0.00	60.62	0.00	0.00	0.00	0.00%
001.6021.4016.000	PROP TAXES,FISHER CM CTR	85,574.24	0.00	673.22	0.00	0.00	0.00	0.00%
001.6021.4018.000	PROP TAXES, TRANSIT	234,841.72	361,328.00	193,572.45	361,328.00	373,335.00	12,007.00	3.32%
001.6021.4020.000	PROP TAX CURR EMERGENCY M	31,045.97	33,911.00	18,237.94	33,911.00	35,747.00	1,836.00	5.41%
001.6021.4021.000	DELINQ EMERGENCY MGNT	3.18	0.00	9.55	0.00	0.00	0.00	0.00%
001.6021.4030.000	PROPERTY TAX CURR AG LAND	16,331.33	16,618.00	10,292.19	16,618.00	16,516.00	-102.00	-0.61%
001.6021.4070.000	PROP TAX CURR TORT LIAB INS	316,752.64	491,369.00	263,225.72	491,369.00	459,370.00	-31,999.00	-6.51%
001.6021.4110.000	UTILITY EXCISE TAX	896,325.96	986,441.00	533,458.85	986,441.00	965,322.00	-21,119.00	-2.14%
001.6021.4120.000	UTILITY FRANCHISE FEES	162,337.87	165,000.00	101,156.12	140,000.00	140,000.00	0.00	0.00%
001.6021.4140.000	HOTEL/MOTEL TAXES	581,269.56	600,000.00	462,357.06	650,000.00	625,000.00	-25,000.00	-3.85%
001.6021.4150.000	CURRENT MOBILE HOME TAXE	6,855.18	6,300.00	4,752.30	6,300.00	6,800.00	500.00	7.94%
001.6021.4151.000	DELIQ MOBILE HOME TAXES	827.70	0.00	778.98	0.00	0.00	0.00	0.00%
001.6021.4268.000	URBAN REVIT. PERMITS	150.00	100.00	50.00	100.00	100.00	0.00	0.00%
001.6021.4331.000	AG LAND CREDIT	1,051.22	0.00	674.69	0.00	0.00	0.00	0.00%
001.6021.4332.000	AGED INCOME CREDIT	6,451.07	0.00	5,516.64	0.00	0.00	0.00	0.00%
001.6021.4333.000	DISABLED HOMESTEAD CREDIT	21,594.16	0.00	12,185.87	0.00	0.00	0.00	0.00%
001.6021.4334.000	FAMILY FARM CREDIT	0.00	0.00	138.00	0.00	0.00	0.00	0.00%
001.6021.4335.000	HOMESTEAD CREDIT	235,864.35	0.00	126,781.81	0.00	0.00	0.00	0.00%
001.6021.4336.000	MILITARY CREDIT	2,541.03	0.00	0.00	0.00	0.00	0.00	0.00%

Budget Comparison Report

					Comparison 1 Budget	Comparison 1 to Parent Budget		
		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget 2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	%
Account Number								
001.6021.4337.000	MOBILE HOME CREDIT	0.00	0.00	16.16	0.00	0.00	0.00	0.00%
001.6021.4338.000	BUSINESS PROP TAX CREDIT	234,029.64	227,370.00	129,843.70	259,687.00	226,232.00	-33,455.00	-12.88%
001.6021.4339.000	SF295 BACKFILL	160,944.92	141,376.00	71,038.78	142,078.00	111,382.00	-30,696.00	-21.61%
001.6021.4361.000	MONEYS AND CREDITS ON CRE	17,019.29	17,019.00	17,781.59	17,781.00	17,781.00	0.00	0.00%
001.6021.4490.000	ACCOUNTING SERVICES	144,679.12	144,500.00	84,972.82	145,493.00	145,593.00	100.00	0.07%
001.6021.4492.000	FINANCE MISC CHARGES	4,488.68	1,000.00	1,068.36	1,000.00	1,000.00	0.00	0.00%
001.6021.4540.000	PENALTIES/DELIQUENT	626.00	2,000.00	302.00	500.00	500.00	0.00	0.00%
001.6021.4610.000	INTEREST ON INVESTMENTS	138,918.59	120,000.00	71,266.48	120,000.00	120,000.00	0.00	0.00%
001.6021.4616.000	INT CHRGD - ACCTS REC	793.00	2,700.00	0.00	2,700.00	2,700.00	0.00	0.00%
001.6021.4875.000	REFND/REIMB: FINANCE	329.90	0.00	72.10	75.00	75.00	0.00	0.00%
001.6025.4492.000	PERSONNEL MISC CHRGS	25,000.00	25,000.00	12,500.00	25,000.00	25,000.00	0.00	0.00%
001.6025.4875.000	RFNDS/REIMB:	15.61	0.00	31.53	31.00	0.00	-31.00	-100.00%
001.6050.4875.000	REFUNDS/REIMB	6,413.44	3,700.00	3,694.39	3,700.00	3,700.00	0.00	0.00%
001.6050.4879.000	REBATES	39.38	0.00	0.00	0.00	0.00	0.00	0.00%
001.6051.4875.000	RFNDS/REIMB	135.96	0.00	14.55	15.00	0.00	-15.00	-100.00%
001.6051.4879.000	REBATES	49.24	0.00	0.00	0.00	0.00	0.00	0.00%
001.6070.4875.000	RFNDS/REIMB: D.PROC	99.85	0.00	31.45	35.00	35.00	0.00	0.00%
001.6900.4875.000	RFNDS/REIMB: GEN GVT	812.12	1,000.00	4,857.90	4,858.00	1,000.00	-3,858.00	-79.42%
001.6900.4876.000	MISC REV	1,189.36	500.00	765.43	700.00	500.00	-200.00	-28.57%
001.6900.4960.000	SALE OF F.A.-GEN GOVT	500.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6900.4961.000	GENL-NONCAPLZD ASSETS	0.00	0.00	500.00	500.00	0.00	-500.00	-100.00%
001.8016.4616.000	INT CHRGD - ACCTS REC	7.64	0.00	0.00	0.00	0.00	0.00	0.00%
001.9000.6500.110	TR FRM ROAD USE TAX	969,198.07	1,186,057.00	481,530.70	1,143,638.00	1,254,942.00	111,304.00	9.73%
001.9000.6500.112	TR FRM EMPLOYEE BNFT	2,841,743.45	3,635,981.00	1,506,162.49	3,483,483.00	3,903,397.00	419,914.00	12.05%
001.9000.6500.117	TR FRM POLICE RETIRE	1,140,090.77	1,300,401.00	609,381.25	1,273,485.00	1,358,872.00	85,387.00	6.70%
001.9000.6500.119	TR FROM EMEG	261,929.94	0.00	1,903.04	1,903.00	0.00	-1,903.00	-100.00%
001.9000.6500.121	TR FRM LOCAL OPTION	0.00	684,447.00	0.00	567,884.00	1,076,145.00	508,261.00	89.50%
001.9000.6500.125	TR FRM TIF	215,077.95	228,315.00	118,891.00	341,894.00	250,600.00	-91,294.00	-26.70%
001.9000.6500.142	TR FRM SOFTBALL ASSO	106.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.9000.6500.389	TRANSFER IN - ARPA	49,389.00	201,077.00	0.00	0.00	0.00	0.00	0.00%
Total Revenue:		17,837,832.51	20,752,147.00	10,131,627.13	19,824,158.00	20,657,436.00	833,278.00	4.20%
Expense								
001.1010.5010.010	REGULAR-NON UNION	710,360.92	755,537.00	468,794.28	763,350.00	796,209.00	32,859.00	4.30%
001.1010.5010.020	REGULAR-POLICE UNION	2,408,102.71	2,904,576.00	1,597,864.97	2,674,871.00	2,932,993.00	258,122.00	9.65%
001.1010.5020.010	OVERTIME-NON UNION	1,217.11	9,200.00	107.26	9,200.00	9,200.00	0.00	0.00%
001.1010.5020.020	OVERTIME-POLICE UNION	203,751.98	150,000.00	163,331.40	150,000.00	150,000.00	0.00	0.00%
001.1010.5021.010	EXTRA DUTY-NON UNION	857.50	500.00	414.55	500.00	500.00	0.00	0.00%
001.1010.5021.020	EXTRA DUTY-POLICE UNION	13,266.54	12,000.00	11,532.50	12,000.00	12,000.00	0.00	0.00%
001.1010.5021.070	EXTRA DUTY OVERTIME	0.00	500.00	0.00	500.00	500.00	0.00	0.00%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.1010.5050.060	PART-TIME REGULAR	10,114.04	13,646.00	7,500.14	13,646.00	14,376.00	730.00	5.35%
001.1010.5056.040	OTHR DEPT-PPME UNION	3,685.17	0.00	1,322.99	0.00	0.00	0.00	0.00%
001.1010.5057.010	CAR REIMB-NON UNION	4,000.00	4,000.00	2,461.60	4,333.00	4,333.00	0.00	0.00%
001.1010.5060.010	TERM PAYOUTS-NON UNION	8,479.84	0.00	0.00	0.00	0.00	0.00	0.00%
001.1010.5060.020	TERM PAYOUTS-POLICE UNION	28,466.51	0.00	3,372.02	0.00	0.00	0.00	0.00%
001.1010.5061.010	RHSA PAYOUTS-NON UNION	0.00	0.00	0.00	33,838.00	0.00	-33,838.00	-100.00%
001.1010.5061.020	RHSA PAYOUTS-POLICE UNION	0.00	0.00	0.00	0.00	19,198.00	19,198.00	0.00%
001.1010.5101.010	SOCIAL SECURITY-NON UNION	3,104.96	3,480.00	1,999.93	3,450.00	3,702.00	252.00	7.30%
001.1010.5101.020	SOCIAL SECURITY-POLICE UNIC	9,595.36	10,946.00	4,794.63	7,709.00	11,007.00	3,298.00	42.78%
001.1010.5101.040	SOCIAL SECURITY-PPME UNION	214.68	0.00	77.26	0.00	0.00	0.00	0.00%
001.1010.5101.060	SOCIAL SECURITY-PT REGULAR	627.08	846.00	465.04	846.00	891.00	45.00	5.32%
001.1010.5102.010	MEDICARE-NON UNION	10,193.09	11,018.00	6,637.37	11,131.00	11,741.00	610.00	5.48%
001.1010.5102.020	MEDICARE-POLICE UNION	38,197.07	43,987.00	25,749.42	40,656.00	46,574.00	5,918.00	14.56%
001.1010.5102.040	MEDICARE-PPME UNION	50.22	0.00	18.06	0.00	0.00	0.00	0.00%
001.1010.5102.060	MEDICARE-PT REGULAR	146.66	198.00	108.78	198.00	208.00	10.00	5.05%
001.1010.5111.010	IPERS-NON UNION	5,076.51	5,298.00	3,271.46	5,252.00	5,636.00	384.00	7.31%
001.1010.5111.020	IPERS-POLICE UNION	14,649.00	16,667.00	7,468.96	11,738.00	16,759.00	5,021.00	42.78%
001.1010.5111.040	IPERS-PPME UNION	347.90	0.00	124.90	0.00	0.00	0.00	0.00%
001.1010.5111.060	IPERS-PT REGULAR	954.75	1,288.00	707.98	1,288.00	1,357.00	69.00	5.36%
001.1010.5113.010	RETIREMENT-NON UNION	150,947.92	158,487.00	98,494.38	160,368.00	167,039.00	6,671.00	4.16%
001.1010.5113.020	RETIREMENT-POLICE UNION	531,691.71	647,403.00	351,048.36	607,183.00	654,197.00	47,014.00	7.74%
001.1010.5121.010	GRP INSUR-NON UNION	114,155.82	131,790.00	73,026.56	158,657.00	159,427.00	770.00	0.49%
001.1010.5121.020	GRP INSUR-POLICE UNION	466,470.13	625,208.00	293,002.57	580,564.00	703,786.00	123,222.00	21.22%
001.1010.5121.040	GRP INSUR-PPME UNION	1,289.40	0.00	439.02	0.00	0.00	0.00	0.00%
001.1010.5122.000	RETIRES GRP HLTH INS	129,087.91	135,155.00	71,863.55	135,155.00	135,155.00	0.00	0.00%
001.1010.5123.010	WORKCOMP-NON UNION	9,486.99	9,887.00	6,424.23	9,994.00	10,532.00	538.00	5.38%
001.1010.5123.020	WORKCOMP-POLICE UNION	37,482.94	40,297.00	25,428.89	37,706.00	42,758.00	5,052.00	13.40%
001.1010.5123.040	WORKCOMP-PPME UNION	86.21	0.00	28.70	0.00	0.00	0.00	0.00%
001.1010.5123.060	WORKCOMP-PT REGULAR	240.14	324.00	163.39	297.00	313.00	16.00	5.39%
001.1010.5132.000	CLOTHING EXPENSE	33,900.91	25,000.00	24,692.99	30,000.00	30,000.00	0.00	0.00%
001.1010.5151.000	PHYSICALS/IMMUNIZATIONS	5,509.00	4,000.00	1,152.00	4,000.00	4,000.00	0.00	0.00%
001.1010.5210.000	ADVERTISING & LEGAL PUB	626.41	1,500.00	349.80	1,500.00	1,500.00	0.00	0.00%
001.1010.5230.000	CONSULTING & PROF FEES	13,304.95	7,000.00	3,756.50	7,000.00	7,000.00	0.00	0.00%
001.1010.5280.000	DUES, MEMBER, SUBSCRIPTN	33,977.76	28,000.00	22,712.90	28,000.00	28,000.00	0.00	0.00%
001.1010.5290.000	INSURANCE - GENERAL	12,673.22	25,155.00	0.00	13,941.00	15,335.00	1,394.00	10.00%
001.1010.5300.000	INSURANCE - TORT LIAB	54,521.94	83,370.00	0.00	59,974.00	65,972.00	5,998.00	10.00%
001.1010.5321.000	K9 EXPENSES	0.00	1,000.00	0.00	1,000.00	1,000.00	0.00	0.00%
001.1010.5339.000	MEDICAL CLAIMS PAID BY CITY	53.63	0.00	0.00	0.00	0.00	0.00	0.00%
001.1010.5342.000	CONTRACT-OUTSIDE HELP	1,870.71	1,000.00	11,268.30	11,000.00	9,000.00	-2,000.00	-18.18%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.1010.5344.000	CONTRACT-MAINTENANCE	15,848.46	23,747.00	16,152.12	23,747.00	23,747.00	0.00	0.00%
001.1010.5347.000	CONTRACT-SOFTWARE MAINT	40,190.56	34,000.00	27,985.52	34,000.00	34,000.00	0.00	0.00%
001.1010.5359.000	TOWING SERVICES	2,921.00	500.00	1,709.00	1,700.00	500.00	-1,200.00	-70.59%
001.1010.5360.000	POSTAGE & SHIPPING	904.22	700.00	693.32	700.00	700.00	0.00	0.00%
001.1010.5370.000	PRINTING & BINDING	1,199.40	500.00	493.31	500.00	500.00	0.00	0.00%
001.1010.5380.000	RENTS & LEASES	0.00	14,500.00	32.00	0.00	0.00	0.00	0.00%
001.1010.5410.000	REPAIRS & MAINTENANCE	11,703.04	18,000.00	7,777.80	18,000.00	18,000.00	0.00	0.00%
001.1010.5431.000	INTERPRETING	21,198.83	15,000.00	7,852.88	8,000.00	7,500.00	-500.00	-6.25%
001.1010.5450.000	TELEPHONE/OTHR COMMNCTI	12,666.81	8,500.00	7,285.51	8,500.00	8,500.00	0.00	0.00%
001.1010.5451.000	OTHR COMMNCTN/AIR CARDS	6,547.13	9,100.00	3,173.54	9,100.00	9,100.00	0.00	0.00%
001.1010.5460.000	CONFERENCE EXPENSE	30,960.43	15,000.00	12,560.88	15,000.00	15,000.00	0.00	0.00%
001.1010.5461.000	TRAVEL-AIRFARE	306.40	0.00	0.00	0.00	0.00	0.00	0.00%
001.1010.5462.000	TRAVEL EXPENSE - OTHER	191.50	100.00	0.00	100.00	100.00	0.00	0.00%
001.1010.5464.000	TRAVEL-PER DIEM	2,648.88	1,000.00	2,586.63	2,500.00	2,000.00	-500.00	-20.00%
001.1010.5465.000	TRAVEL - HOTEL/MOTEL	7,432.37	2,500.00	9,644.82	10,000.00	3,500.00	-6,500.00	-65.00%
001.1010.5470.000	TRAINING-NEW OFFICER	37,979.74	18,000.00	5,500.00	18,000.00	18,000.00	0.00	0.00%
001.1010.5471.000	TRAINING	512.44	400.00	0.00	400.00	400.00	0.00	0.00%
001.1010.5472.000	MILEAGE REIMBURSE	3,689.00	1,700.00	806.85	1,700.00	1,700.00	0.00	0.00%
001.1010.5475.000	RECRUITING EXPENSES	0.00	350.00	7,441.50	7,350.00	2,500.00	-4,850.00	-65.99%
001.1010.5565.000	VEHICLE OPER/MAINT SPPLY	26,502.86	25,000.00	12,464.89	25,000.00	25,000.00	0.00	0.00%
001.1010.5570.000	VEHICLE GAS	77,269.71	85,000.00	47,927.20	85,000.00	85,000.00	0.00	0.00%
001.1010.5571.000	VEHICLE DIESEL FUEL	122.12	500.00	0.00	500.00	500.00	0.00	0.00%
001.1010.5600.000	OPERATING SUPPLIES	24,088.13	21,500.00	16,459.32	21,500.00	21,500.00	0.00	0.00%
001.1010.5601.000	PROMOTION/PROGRAM SPPLY	2,232.03	2,000.00	566.09	2,000.00	2,000.00	0.00	0.00%
001.1010.5605.000	OFFICE SUPPLIES	2,822.43	3,000.00	939.95	3,000.00	3,000.00	0.00	0.00%
001.1010.5610.000	AMMUNITION EXPENSE	20,066.91	20,000.00	18,609.20	20,000.00	20,000.00	0.00	0.00%
001.1010.5612.000	COMPUTER COMPONENTS	135.00	1,500.00	0.00	1,500.00	1,500.00	0.00	0.00%
001.1010.5702.000	MINOR OFFICE FURN/EQUIP	191.35	0.00	4,900.74	0.00	0.00	0.00	0.00%
001.1010.5703.000	MINOR COMPUTER	3,067.14	2,000.00	2,585.18	2,000.00	2,000.00	0.00	0.00%
001.1010.5704.000	MINOR SOFTWARE	1,323.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.1010.5718.000	MINOR EQUIP, UNCLASSIFIED	7,853.32	7,500.00	5,700.14	7,500.00	7,500.00	0.00	0.00%
001.1011.5230.000	CONSULTING & PROF FEES	112,800.00	125,000.00	0.00	0.00	0.00	0.00	0.00%
001.1011.5342.000	CONTRACT-OUTSIDE HELP	216,720.00	300,000.00	0.00	0.00	0.00	0.00	0.00%
001.1030.5331.000	PAYMENTS-OTHER ENTITIES	36,011.00	37,815.00	37,812.00	37,815.00	39,703.00	1,888.00	4.99%
001.1030.5410.000	REPAIRS & MAINTENANCE	0.00	0.00	59.73	0.00	0.00	0.00	0.00%
001.1030.5481.000	ELECTRICITY (SIRENS)	1,613.17	1,980.00	1,143.99	1,980.00	1,980.00	0.00	0.00%
001.1030.5600.000	OPERATING SUPPLIES	139.99	400.00	387.80	400.00	400.00	0.00	0.00%
001.1040.5300.000	INSURANCE - TORT LIAB	0.00	10.00	0.00	0.00	0.00	0.00	0.00%
001.1040.5485.000	STORM WATER FEES	0.00	51.00	98.40	99.00	0.00	-99.00	-100.00%

Budget Comparison Report

					Comparison 1	Comparison 1		
					Budget	to Parent		
					Parent Budget	Budget		
					2024-2025	2025-2026	Increase /	%
					FY25 Amendm...	FY26 Dept	(Decrease)	
Account Number		2023-2024	2024-2025	2024-2025				
		Total Activity	Total Budget	YTD Activity		Request		
				Through Jan				
001.1050.5010.010	REGULAR-NON UNION	639,809.58	711,036.00	384,177.56	600,901.00	714,739.00	113,838.00	18.94%
001.1050.5010.030	REGULAR-FIRE UNION	1,511,059.55	1,672,337.00	979,177.65	1,684,862.00	1,714,368.00	29,506.00	1.75%
001.1050.5020.010	OVERTIME-NON UNION	0.00	0.00	1,499.61	1,000.00	0.00	-1,000.00	-100.00%
001.1050.5020.030	OVERTIME-FIRE UNION	85,425.65	68,000.00	48,269.05	93,000.00	95,000.00	2,000.00	2.15%
001.1050.5056.040	OTHR DEPT-PPME UNION	521.37	0.00	178.38	0.00	0.00	0.00	0.00%
001.1050.5060.010	TERM PAYOUTS-NON UNION	6,384.68	0.00	0.00	0.00	0.00	0.00	0.00%
001.1050.5061.010	RHSA PAYOUTS-NON UNION	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.1050.5061.030	RHSA PAYOUTS-FIRE UNION	0.00	0.00	25,909.73	54,450.00	0.00	-54,450.00	-100.00%
001.1050.5101.010	SOCIAL SECURITY-NON UNION	9,928.62	12,466.00	1,808.99	3,289.00	3,632.00	343.00	10.43%
001.1050.5101.040	SOCIAL SECURITY-PPME UNION	30.41	0.00	11.06	0.00	0.00	0.00	0.00%
001.1050.5102.010	MEDICARE-NON UNION	8,980.78	10,310.00	5,363.32	8,713.00	10,364.00	1,651.00	18.95%
001.1050.5102.030	MEDICARE-FIRE UNION	21,503.86	25,235.00	13,874.69	25,779.00	26,236.00	457.00	1.77%
001.1050.5102.040	MEDICARE-PPME UNION	7.11	0.00	2.59	0.00	0.00	0.00	0.00%
001.1050.5111.010	IPERS-NON UNION	4,901.26	5,140.00	3,207.43	5,008.00	5,530.00	522.00	10.42%
001.1050.5111.040	IPERS-PPME UNION	49.21	0.00	16.84	0.00	0.00	0.00	0.00%
001.1050.5112.010	ICMA-NON UNION	20,576.99	27,858.00	0.00	0.00	0.00	0.00	0.00%
001.1050.5113.010	RETIREMENT-NON UNION	110,209.68	115,559.00	79,355.56	124,144.00	148,817.00	24,673.00	19.87%
001.1050.5113.030	RETIREMENT-FIRE UNION	347,241.46	378,952.00	221,881.47	381,790.00	388,819.00	7,029.00	1.84%
001.1050.5121.010	GRP INSUR-NON UNION	85,040.66	98,046.00	49,402.06	87,054.00	106,985.00	19,931.00	22.89%
001.1050.5121.030	GRP INSUR-FIRE UNION	355,346.18	423,204.00	216,390.32	390,410.00	459,413.00	69,003.00	17.67%
001.1050.5121.040	GRP INSUR-PPME UNION	176.08	0.00	0.00	0.00	0.00	0.00	0.00%
001.1050.5122.000	RETIREEES GRP HLTH INS	81,345.34	96,329.00	50,173.08	96,329.00	96,329.00	0.00	0.00%
001.1050.5123.010	WORKCOMP-NON UNION	29,979.92	33,118.00	17,231.42	27,639.00	33,095.00	5,456.00	19.74%
001.1050.5123.030	WORKCOMP-FIRE UNION	83,068.61	87,539.00	51,360.77	89,426.00	91,011.00	1,585.00	1.77%
001.1050.5123.040	WORKCOMP-PPME UNION	12.20	0.00	3.87	0.00	0.00	0.00	0.00%
001.1050.5132.000	CLOTHING EXPENSE	15,254.92	21,000.00	7,340.75	21,000.00	21,000.00	0.00	0.00%
001.1050.5151.000	PHYSICALS/IMMUNIZATIONS	0.00	7,500.00	1,074.00	7,500.00	7,500.00	0.00	0.00%
001.1050.5210.000	ADVERTISING & LEGAL PUB	513.11	0.00	0.00	0.00	0.00	0.00	0.00%
001.1050.5216.000	BACKGROUND CHECKS	0.00	0.00	19.00	19.00	0.00	-19.00	-100.00%
001.1050.5251.000	LICENSE & PERMITS	0.00	400.00	42.25	400.00	400.00	0.00	0.00%
001.1050.5280.000	DUES, MEMBER, SUBSCRIPTN	2,066.15	2,600.00	934.57	2,600.00	2,600.00	0.00	0.00%
001.1050.5290.000	INSURANCE - GENERAL	32,212.02	40,499.00	0.00	35,433.00	38,977.00	3,544.00	10.00%
001.1050.5300.000	INSURANCE - TORT LIAB	17,553.12	24,096.00	0.00	19,308.00	21,239.00	1,931.00	10.00%
001.1050.5342.000	CONTRACT-OUTSIDE HELP	32,885.34	30,000.00	6,936.19	30,000.00	0.00	-30,000.00	-100.00%
001.1050.5344.000	CONTRACT-MAINTENANCE	10,900.24	20,000.00	687.58	15,000.00	15,000.00	0.00	0.00%
001.1050.5347.000	CONTRACT-SOFTWARE MAINT	24,460.08	28,500.00	20,952.60	28,500.00	28,500.00	0.00	0.00%
001.1050.5347.150	CONTRACT-CMPTR TECH SPPR	0.00	650.00	0.00	650.00	650.00	0.00	0.00%
001.1050.5360.000	POSTAGE & SHIPPING	608.33	550.00	0.00	550.00	550.00	0.00	0.00%
001.1050.5370.000	PRINTING & BINDING	27.95	0.00	0.00	0.00	0.00	0.00	0.00%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.1050.5380.000	RENTS & LEASES	175.18	400.00	0.00	400.00	400.00	0.00	0.00%
001.1050.5410.000	REPAIRS & MAINTENANCE	8,534.66	7,000.00	9,278.96	7,000.00	7,000.00	0.00	0.00%
001.1050.5413.000	VEHICLE REPAIRS & MAINTENA	20,260.05	11,500.00	5,864.86	11,500.00	11,500.00	0.00	0.00%
001.1050.5450.000	TELEPHONE/OTHR COMMNCTI	7,813.07	8,000.00	4,873.96	8,000.00	8,000.00	0.00	0.00%
001.1050.5460.000	CONFERENCE EXPENSE	6,441.50	10,000.00	4,620.40	10,000.00	10,000.00	0.00	0.00%
001.1050.5464.000	TRAVEL-PER DIEM	358.23	0.00	0.00	0.00	0.00	0.00	0.00%
001.1050.5470.000	TRAINING	765.68	1,200.00	82.61	1,200.00	1,200.00	0.00	0.00%
001.1050.5475.000	RECRUITING EXPENSES	2,310.33	0.00	29,372.57	29,373.00	0.00	-29,373.00	-100.00%
001.1050.5565.000	VEHICLE OPER/MAINT SPPLY	2,277.17	3,750.00	532.96	3,750.00	3,750.00	0.00	0.00%
001.1050.5570.000	VEHICLE GAS	3,046.68	4,200.00	1,625.49	4,200.00	4,200.00	0.00	0.00%
001.1050.5571.000	VEHICLE DIESEL FUEL	11,079.25	15,000.00	6,035.58	15,000.00	15,000.00	0.00	0.00%
001.1050.5600.000	OPERATING SUPPLIES	9,166.40	9,500.00	5,506.27	9,500.00	9,500.00	0.00	0.00%
001.1050.5601.000	PROMOTION/PROGRAM SPPLY	0.00	400.00	0.00	400.00	400.00	0.00	0.00%
001.1050.5605.000	OFFICE SUPPLIES	288.97	1,300.00	83.88	1,300.00	1,300.00	0.00	0.00%
001.1050.5630.000	EMS SUPPLIES	9,652.90	5,000.00	2,757.18	5,000.00	5,000.00	0.00	0.00%
001.1050.5702.000	MINOR OFFICE FURN/EQUIP	899.97	0.00	0.00	0.00	0.00	0.00	0.00%
001.1050.5703.000	MINOR COMPUTER	2,368.32	950.00	0.00	950.00	950.00	0.00	0.00%
001.1050.5718.000	MINOR EQUIP, UNCLASSIFIED	4,104.34	10,000.00	1,653.89	10,000.00	10,000.00	0.00	0.00%
001.1070.5010.010	REGULAR-NON UNION	26,103.75	25,081.00	7,564.47	31,053.00	24,237.00	-6,816.00	-21.95%
001.1070.5030.070	PART-TIME TEMPORARY	0.00	0.00	411.75	0.00	0.00	0.00	0.00%
001.1070.5101.010	SOCIAL SECURITY-NON UNION	1,618.65	1,555.00	439.55	1,925.00	1,503.00	-422.00	-21.92%
001.1070.5101.070	SOCIAL SECURITY-PT TEMP	0.00	0.00	25.52	0.00	0.00	0.00	0.00%
001.1070.5102.010	MEDICARE-NON UNION	378.59	364.00	102.80	450.00	351.00	-99.00	-22.00%
001.1070.5102.070	MEDICARE-TEMPORARY	0.00	0.00	5.96	0.00	0.00	0.00	0.00%
001.1070.5111.010	IPERS-NON UNION	2,464.14	2,368.00	631.22	2,931.00	2,288.00	-643.00	-21.94%
001.1070.5111.070	IPERS-PT TEMP	0.00	0.00	38.87	0.00	0.00	0.00	0.00%
001.1070.5121.010	GRP INSUR-NON UNION	0.00	2,371.00	1,864.53	9,038.00	6,545.00	-2,493.00	-27.58%
001.1070.5122.000	RETIREEES GRP HLTH INS	6,361.30	5,364.00	3,195.98	5,364.00	5,364.00	0.00	0.00%
001.1070.5123.010	WORKCOMP-NON UNION	540.61	504.00	65.67	557.00	435.00	-122.00	-21.90%
001.1070.5123.070	WORKCOMP-TEMPORARY	0.00	0.00	0.64	0.00	0.00	0.00	0.00%
001.1070.5210.000	ADVERTISING & LEGAL PUB	14.75	0.00	1,013.45	1,014.00	0.00	-1,014.00	-100.00%
001.1070.5280.000	DUES, MEMBER, SUBSCRIPTN	160.00	400.00	170.00	400.00	400.00	0.00	0.00%
001.1070.5290.000	INSURANCE - GENERAL	324.35	629.00	0.00	357.00	392.00	35.00	9.80%
001.1070.5300.000	INSURANCE - TORT LIAB	1,051.00	1,203.00	0.00	1,156.00	1,272.00	116.00	10.03%
001.1070.5342.000	CONTRACT-OUTSIDE HELP	153,531.67	213,750.00	91,542.95	174,750.00	174,750.00	0.00	0.00%
001.1070.5344.000	CONTRACT-MAINTENANCE	0.01	0.00	0.27	0.00	0.00	0.00	0.00%
001.1070.5360.000	POSTAGE & SHIPPING	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.1070.5450.000	TELEPHONE/OTHR COMMNCTI	500.74	500.00	175.76	500.00	500.00	0.00	0.00%
001.1070.5605.000	OFFICE SUPPLIES	0.00	100.00	107.72	100.00	100.00	0.00	0.00%

Budget Comparison Report

					Comparison 1	Comparison 1	%
					Budget	to Parent	
					Budget	Budget	
					2024-2025	Increase /	
					FY25 Amendm...	(Decrease)	
					FY26 Dept		
					Request		
Account Number		2023-2024	2024-2025	2024-2025			
		Total Activity	Total Budget	YTD Activity			
				Through Jan			
001.1070.5980.000	REFUNDS/REIMB	155.00	0.00	108.00	108.00	0.00	-100.00%
001.1071.5010.010	REGULAR-NON UNION	53,464.75	50,835.00	33,891.34	73,645.00	68,113.00	-7.51%
001.1071.5101.010	SOCIAL SECURITY-NON UNION	3,042.45	3,152.00	1,932.44	4,566.00	4,223.00	-7.51%
001.1071.5102.010	MEDICARE-NON UNION	711.61	737.00	451.96	1,068.00	988.00	-7.49%
001.1071.5111.010	IPERS-NON UNION	5,047.05	4,799.00	3,116.44	6,952.00	6,430.00	-7.51%
001.1071.5121.010	GRP INSUR-NON UNION	12,937.06	12,495.00	7,115.34	18,932.00	18,188.00	-3.93%
001.1071.5123.010	WORKCOMP-NON UNION	1,101.47	870.00	554.68	813.00	1,178.00	44.90%
001.1071.5210.000	ADVERTISING & LEGAL PUB	14.75	0.00	1,013.45	1,014.00	0.00	-100.00%
001.1071.5251.000	LICENSE & PERMITS	180.00	0.00	0.00	0.00	0.00	0.00%
001.1071.5280.000	DUES, MEMBER, SUBSCRIPTN	0.00	50.00	0.00	50.00	50.00	0.00%
001.1071.5290.000	INSURANCE - GENERAL	654.70	1,265.00	0.00	720.00	792.00	10.00%
001.1071.5300.000	INSURANCE - TORT LIAB	798.04	1,071.00	0.00	878.00	966.00	10.02%
001.1071.5342.000	CONTRACT-OUTSIDE HELP	77,590.00	150,000.00	42,400.00	100,000.00	100,000.00	0.00%
001.1071.5344.000	CONTRACT-MAINTENANCE	136.91	0.00	172.48	250.00	250.00	0.00%
001.1071.5360.000	POSTAGE & SHIPPING	1,672.34	1,000.00	1,998.84	3,000.00	3,000.00	0.00%
001.1071.5450.000	TELEPHONE/OTHR COMMNCTI	1,175.56	700.00	604.44	1,000.00	1,000.00	0.00%
001.1071.5460.000	CONFERENCE EXPENSE	0.00	400.00	0.00	400.00	400.00	0.00%
001.1071.5565.000	VEHICLE OPER/MAINT SPPLY	0.00	500.00	36.05	500.00	500.00	0.00%
001.1071.5570.000	VEHICLE GAS	506.08	600.00	318.43	600.00	600.00	0.00%
001.1071.5600.000	OPERATING SUPPLIES	74.96	250.00	176.22	250.00	250.00	0.00%
001.1071.5605.000	OFFICE SUPPLIES	58.92	200.00	52.55	200.00	200.00	0.00%
001.1071.5703.000	MINOR COMPUTER	74.99	0.00	0.00	0.00	0.00	0.00%
001.1071.5980.000	REFUNDS/REIMB	30.00	0.00	0.00	0.00	0.00	0.00%
001.1072.5010.010	REGULAR-NON UNION	83.30	0.00	0.00	0.00	0.00	0.00%
001.1072.5010.040	REGULAR-PPME UNION	1,701.43	0.00	0.00	0.00	0.00	0.00%
001.1072.5101.010	SOCIAL SECURITY-NON UNION	5.17	0.00	0.00	0.00	0.00	0.00%
001.1072.5101.040	SOCIAL SECURITY-PPME UNION	94.72	0.00	0.00	0.00	0.00	0.00%
001.1072.5102.010	MEDICARE-NON UNION	1.21	0.00	0.00	0.00	0.00	0.00%
001.1072.5102.040	MEDICARE-PPME UNION	22.17	0.00	0.00	0.00	0.00	0.00%
001.1072.5111.010	IPERS-NON UNION	7.86	0.00	0.00	0.00	0.00	0.00%
001.1072.5111.040	IPERS-PPME UNION	160.65	0.00	0.00	0.00	0.00	0.00%
001.1072.5121.040	GRP INSUR-PPME UNION	979.16	0.00	0.00	0.00	0.00	0.00%
001.1072.5122.000	RETIREES GRP HLTH INS	1,196.74	1,354.00	0.00	0.00	0.00	0.00%
001.1072.5123.010	WORKCOMP-NON UNION	3.26	0.00	0.00	0.00	0.00	0.00%
001.1072.5123.040	WORKCOMP-PPME UNION	95.20	0.00	0.00	0.00	0.00	0.00%
001.1072.5151.000	PHYSICALS/IMMUNIZATIONS	76.32	0.00	0.00	0.00	0.00	0.00%
001.1072.5210.000	ADVERTISING & LEGAL PUB	157.97	0.00	0.00	0.00	0.00	0.00%
001.1072.5300.000	INSURANCE - TORT LIAB	120.00	478.00	0.00	0.00	0.00	0.00%
001.1072.5980.000	REFUNDS/REIMB	260.00	0.00	0.00	0.00	0.00	0.00%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.1075.5010.010	REGULAR-NON UNION	61,417.60	67,606.00	55,735.62	122,440.00	120,841.00	-1,599.00	-1.31%
001.1075.5101.010	SOCIAL SECURITY-NON UNION	3,583.53	4,192.00	3,216.78	7,591.00	7,492.00	-99.00	-1.30%
001.1075.5102.010	MEDICARE-NON UNION	838.04	980.00	752.26	1,775.00	1,752.00	-23.00	-1.30%
001.1075.5111.010	IPERS-NON UNION	5,797.84	6,382.00	5,178.56	11,558.00	11,407.00	-151.00	-1.31%
001.1075.5121.010	GRP INSUR-NON UNION	19,625.84	24,900.00	20,206.76	45,849.00	47,452.00	1,603.00	3.50%
001.1075.5123.010	WORKCOMP-NON UNION	1,266.82	1,359.00	738.75	2,198.00	2,124.00	-74.00	-3.37%
001.1075.5151.000	PHYSICALS/IMMUNIZATIONS	0.00	0.00	69.76	0.00	0.00	0.00	0.00%
001.1075.5210.000	ADVERTISING & LEGAL PUB	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.1075.5230.000	CONSULTING & PROF FEES	0.00	0.00	137.50	0.00	0.00	0.00	0.00%
001.1075.5234.000	LEGAL EXPENSES	811.20	0.00	602.35	0.00	0.00	0.00	0.00%
001.1075.5250.000	COURT, RECORD & FILING FEES	131.20	0.00	0.00	0.00	0.00	0.00	0.00%
001.1075.5261.000	RESIDENTIAL CLEANUP	37,755.98	15,000.00	22,672.00	35,000.00	35,000.00	0.00	0.00%
001.1075.5262.000	RESIDENTIAL SNOW REMOVAL	5,755.00	5,000.00	700.00	5,000.00	5,000.00	0.00	0.00%
001.1075.5263.000	RESIDENTIAL WEED CONTROL	19,932.50	15,000.00	16,011.00	20,000.00	20,000.00	0.00	0.00%
001.1075.5290.000	INSURANCE - GENERAL	330.35	638.00	0.00	363.00	400.00	37.00	10.19%
001.1075.5300.000	INSURANCE - TORT LIAB	672.04	875.00	0.00	739.00	813.00	74.00	10.01%
001.1075.5344.000	CONTRACT-MAINTENANCE	69.59	0.00	87.84	0.00	0.00	0.00	0.00%
001.1075.5347.000	CONTRACT-SOFTWARE MAINT	0.00	12,150.00	0.00	12,150.00	12,150.00	0.00	0.00%
001.1075.5359.000	TOWING SERVICES	745.00	1,000.00	12,720.00	8,000.00	1,000.00	-7,000.00	-87.50%
001.1075.5360.000	POSTAGE & SHIPPING	2,515.62	2,000.00	2,071.68	2,500.00	2,500.00	0.00	0.00%
001.1075.5410.000	REPAIRS & MAINTENANCE	0.00	200.00	0.00	200.00	200.00	0.00	0.00%
001.1075.5440.000	TAXES PAID	1,212.00	2,000.00	960.00	2,000.00	2,000.00	0.00	0.00%
001.1075.5450.000	TELEPHONE/OTHR COMMNCTI	1,327.90	1,200.00	1,212.29	1,800.00	2,300.00	500.00	27.78%
001.1075.5460.000	CONFERENCE EXPENSE	0.00	150.00	0.00	150.00	150.00	0.00	0.00%
001.1075.5483.000	WATER	10.40	500.00	0.00	500.00	500.00	0.00	0.00%
001.1075.5485.000	STORM WATER FEES	731.99	690.00	276.79	732.00	0.00	-732.00	-100.00%
001.1075.5565.000	VEHICLE OPER/MAINT SPPLY	65.00	500.00	2,402.52	2,500.00	500.00	-2,000.00	-80.00%
001.1075.5570.000	VEHICLE GAS	1,585.16	1,500.00	966.86	1,500.00	1,500.00	0.00	0.00%
001.1075.5600.000	OPERATING SUPPLIES	0.00	200.00	264.99	265.00	200.00	-65.00	-24.53%
001.1075.5605.000	OFFICE SUPPLIES	6.98	200.00	12.16	200.00	200.00	0.00	0.00%
001.1075.5612.000	COMPUTER COMPONENTS	602.89	0.00	0.00	0.00	0.00	0.00	0.00%
001.1075.5703.000	MINOR COMPUTER	0.00	0.00	373.00	373.00	0.00	-373.00	-100.00%
001.1090.5331.000	PAYMENTS-OTHER ENTITIES	83,200.00	86,528.00	57,685.36	86,528.00	89,989.00	3,461.00	4.00%
001.1099.5010.010	REGULAR-NON UNION	1,768.34	2,027.00	1,234.17	2,027.00	2,140.00	113.00	5.57%
001.1099.5101.010	SOCIAL SECURITY-NON UNION	109.67	126.00	75.59	126.00	133.00	7.00	5.56%
001.1099.5102.010	MEDICARE-NON UNION	25.63	29.00	17.67	29.00	31.00	2.00	6.90%
001.1099.5111.010	IPERS-NON UNION	166.99	191.00	116.53	191.00	202.00	11.00	5.76%
001.1099.5121.010	GRP INSUR-NON UNION	0.00	0.00	81.67	0.00	0.00	0.00	0.00%
001.1099.5123.010	WORKCOMP-NON UNION	43.16	48.00	26.81	44.00	47.00	3.00	6.82%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.1099.5251.000	POLICE/FIRE BLDG - LICENSE &	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.1099.5290.000	INSURANCE - GENERAL	45,905.95	49,560.00	0.00	50,497.00	55,546.00	5,049.00	10.00%
001.1099.5300.000	INSURANCE - TORT LIAB	984.00	1,189.00	0.00	1,082.00	1,191.00	109.00	10.07%
001.1099.5342.000	CONTRACT-OUTSIDE HELP	15,786.96	15,000.00	7,904.61	15,000.00	15,800.00	800.00	5.33%
001.1099.5344.000	CONTRACT-MAINTENANCE	7,565.88	8,648.00	3,584.20	8,648.00	8,648.00	0.00	0.00%
001.1099.5347.000	CONTRACT SOFTWARE & TECH	5,074.64	3,600.00	1,526.23	3,600.00	3,600.00	0.00	0.00%
001.1099.5386.000	CONTRACT LAWN CARE	14,203.60	16,500.00	10,817.80	16,500.00	16,500.00	0.00	0.00%
001.1099.5410.000	REPAIRS & MAINTENANCE	21,793.08	17,000.00	7,357.84	17,000.00	17,000.00	0.00	0.00%
001.1099.5450.000	TELEPHONE/OTHER COMMNC	33,441.54	32,000.00	18,208.32	32,000.00	32,000.00	0.00	0.00%
001.1099.5481.000	ELECTRICITY	72,330.77	102,300.00	61,355.31	102,300.00	102,300.00	0.00	0.00%
001.1099.5482.000	NATURAL GAS	28,925.17	33,000.00	12,419.86	33,000.00	33,000.00	0.00	0.00%
001.1099.5483.000	WATER	0.00	0.00	788.25	0.00	0.00	0.00	0.00%
001.1099.5485.000	STORM WATER FEES	0.00	2,290.00	4,757.24	4,815.00	0.00	-4,815.00	-100.00%
001.1099.5488.000	SEWER	0.00	0.00	112.72	0.00	0.00	0.00	0.00%
001.1099.5611.000	BLDG,GRD OPER/MAINT SPLY	2,136.11	1,500.00	1,066.64	1,500.00	1,500.00	0.00	0.00%
001.1099.5718.000	MINOR EQUIP, UNCLASSIFIED	0.00	0.00	211.19	0.00	0.00	0.00	0.00%
001.2010.5010.010	REGULAR-NON UNION	84,820.00	94,978.00	57,188.00	94,978.00	100,288.00	5,310.00	5.59%
001.2010.5010.040	REGULAR-PPME UNION	511,251.09	698,831.00	371,624.51	706,567.00	737,185.00	30,618.00	4.33%
001.2010.5020.040	OVERTIME-PPME UNION	9,090.52	0.00	3,269.25	5,000.00	0.00	-5,000.00	-100.00%
001.2010.5020.090	OVERTIME-P&R UNION	52.38	0.00	0.00	0.00	0.00	0.00	0.00%
001.2010.5030.070	PART-TIME TEMPORARY	0.00	4,000.00	0.00	4,000.00	4,000.00	0.00	0.00%
001.2010.5060.040	TERM PAYOUTS-PPME UNION	4,094.15	0.00	1,269.30	0.00	0.00	0.00	0.00%
001.2010.5101.010	SOCIAL SECURITY-NON UNION	5,083.61	5,888.00	3,453.23	5,889.00	6,218.00	329.00	5.59%
001.2010.5101.040	SOCIAL SECURITY-PPME UNION	30,993.10	43,328.00	22,177.82	43,807.00	45,705.00	1,898.00	4.33%
001.2010.5101.070	SOCIAL SECURITY-PT TEMP	0.00	0.00	0.00	0.00	248.00	248.00	0.00%
001.2010.5101.090	SOCIAL SECURITY-P&R UNION	3.04	0.00	0.00	0.00	0.00	0.00	0.00%
001.2010.5102.010	MEDICARE-NON UNION	1,188.93	1,532.00	807.64	1,377.00	1,454.00	77.00	5.59%
001.2010.5102.040	MEDICARE-PPME UNION	7,248.31	10,133.00	5,186.77	10,245.00	10,689.00	444.00	4.33%
001.2010.5102.070	MEDICARE-TEMPORARY	0.00	0.00	0.00	0.00	58.00	58.00	0.00%
001.2010.5102.090	MEDICARE-P&R UNION	0.71	0.00	0.00	0.00	0.00	0.00	0.00%
001.2010.5111.010	IPERS-NON UNION	8,007.03	8,978.00	5,398.58	8,966.00	9,467.00	501.00	5.59%
001.2010.5111.040	IPERS-PPME UNION	47,093.68	65,970.00	35,389.87	66,700.00	69,590.00	2,890.00	4.33%
001.2010.5111.090	IPERS-P&R UNION	4.94	0.00	0.00	0.00	0.00	0.00	0.00%
001.2010.5121.010	GRP INSUR-NON UNION	16,515.80	16,872.00	9,139.14	16,489.00	19,403.00	2,914.00	17.67%
001.2010.5121.040	GRP INSUR-PPME UNION	142,402.22	202,933.00	108,273.45	198,321.00	233,373.00	35,052.00	17.67%
001.2010.5121.090	GRP INSUR-P&R UNION	18.62	0.00	0.00	0.00	0.00	0.00	0.00%
001.2010.5122.000	RETIRES GRP HLTH INS	37,842.13	39,547.00	20,645.16	39,547.00	39,547.00	0.00	0.00%
001.2010.5123.010	WORKCOMP-NON UNION	1,704.46	5,363.00	1,026.75	4,800.00	5,068.00	268.00	5.58%
001.2010.5123.040	WORKCOMP-PPME UNION	28,289.12	32,959.00	17,846.48	29,968.00	31,163.00	1,195.00	3.99%

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001.2010.5123.070	WORKCOMP-TEMPORARY	0.00	235.00	0.00	235.00	204.00	-31.00	-13.19%
001.2010.5123.090	WORKCOMP-P&R UNION	1.43	0.00	0.00	0.00	0.00	0.00	0.00%
001.2010.5290.000	INSURANCE - GENERAL	41,147.41	63,845.00	675.00	45,937.00	50,531.00	4,594.00	10.00%
001.2010.5300.000	INSURANCE - TORT LIAB	12,090.54	17,271.00	0.00	13,300.00	14,630.00	1,330.00	10.00%
001.2010.5600.000	OPERATING SUPPLIES	37.95	0.00	20.00	0.00	0.00	0.00	0.00%
001.2020.5010.010	REGULAR-NON UNION	3,137.39	0.00	13,203.94	54,835.00	49,210.00	-5,625.00	-10.26%
001.2020.5010.020	REGULAR-POLICE UNION	280.80	40,872.00	0.00	0.00	0.00	0.00	0.00%
001.2020.5030.070	PART-TIME TEMPORARY	0.00	0.00	4,186.58	0.00	0.00	0.00	0.00%
001.2020.5101.010	SOCIAL SECURITY-NON UNION	178.61	0.00	745.09	3,400.00	3,051.00	-349.00	-10.26%
001.2020.5101.020	SOCIAL SECURITY-POLICE UNIC	18.50	2,534.00	0.00	0.00	0.00	0.00	0.00%
001.2020.5101.070	SOCIAL SECURITY-PT TEMP	0.00	0.00	259.58	0.00	0.00	0.00	0.00%
001.2020.5102.010	MEDICARE-NON UNION	41.76	0.00	174.25	795.00	714.00	-81.00	-10.19%
001.2020.5102.020	MEDICARE-POLICE UNION	4.33	593.00	0.00	0.00	0.00	0.00	0.00%
001.2020.5102.070	MEDICARE-PT TEMP	0.00	0.00	60.71	0.00	0.00	0.00	0.00%
001.2020.5111.010	IPERS-NON UNION	278.51	0.00	1,163.59	5,176.00	4,645.00	-531.00	-10.26%
001.2020.5111.020	IPERS-POLICE UNION	17.66	3,858.00	0.00	0.00	0.00	0.00	0.00%
001.2020.5121.010	GRP INSUR-NON UNION	1,356.71	0.00	5,644.12	21,515.00	18,817.00	-2,698.00	-12.54%
001.2020.5121.020	GRP INSUR-POLICE UNION	0.00	23,714.00	0.00	0.00	0.00	0.00	0.00%
001.2020.5123.010	WORKCOMP-NON UNION	5.38	0.00	20.43	85.00	883.00	798.00	938.82%
001.2020.5123.020	WORKCOMP-POLICE UNION	8.17	1,119.00	0.00	0.00	0.00	0.00	0.00%
001.2020.5123.070	WORKCOMP-PT TEMP	0.00	0.00	97.29	0.00	0.00	0.00	0.00%
001.2020.5132.000	CLOTHING EXPENSE	189.99	500.00	0.00	500.00	500.00	0.00	0.00%
001.2020.5151.000	PHYSICALS/IMMUNIZATIONS	0.00	0.00	69.76	70.00	0.00	-70.00	-100.00%
001.2020.5230.000	CONSULTING & PROF FEES	0.00	0.00	137.50	140.00	140.00	0.00	0.00%
001.2020.5290.000	INSURANCE - GENERAL	461.07	1,506.00	0.00	507.00	558.00	51.00	10.06%
001.2020.5300.000	INSURANCE - TORT LIAB	210.00	349.00	0.00	231.00	254.00	23.00	9.96%
001.2020.5344.000	CONTRACT-MAINTENANCE	690.00	750.00	0.00	750.00	750.00	0.00	0.00%
001.2020.5347.000	PARKING SOFTWARE MAINTEN	0.00	0.00	527.37	530.00	550.00	20.00	3.77%
001.2020.5360.000	POSTAGE & SHIPPING	0.00	10.00	0.00	10.00	10.00	0.00	0.00%
001.2020.5444.000	Electric Fuel User Tax	47.42	0.00	206.54	192.00	192.00	0.00	0.00%
001.2020.5450.000	TELEPHONE/OTHR COMMNCTI	0.00	100.00	24.61	455.00	780.00	325.00	71.43%
001.2020.5481.000	ELECTRICITY	1,406.05	2,400.00	1,612.50	2,400.00	2,616.00	216.00	9.00%
001.2020.5485.000	STORM WATER FEES	0.00	4,880.00	9,588.79	9,589.00	0.00	-9,589.00	-100.00%
001.2020.5565.000	VEHICLE OPER/MAINT SPPLY	0.00	0.00	3.03	20.00	20.00	0.00	0.00%
001.2020.5570.000	VEHICLE GAS	0.00	4,200.00	263.54	1,000.00	1,000.00	0.00	0.00%
001.2020.5600.000	OPERATING SUPPLIES	2,153.70	1,900.00	2,060.29	2,100.00	2,100.00	0.00	0.00%
001.2020.5703.000	MINOR COMPUTER	0.00	0.00	175.00	175.00	0.00	-175.00	-100.00%
001.2020.5980.000	REFUNDS/REIMBURSEMENTS	0.00	0.00	605.00	610.00	10.00	-600.00	-98.36%
001.2030.5010.010	REGULAR-NON UNION	7,862.21	8,717.00	5,346.49	8,717.00	9,203.00	486.00	5.58%

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001.2030.5010.040	REGULAR-PPME UNION	23,672.86	44,108.00	20,580.59	45,895.00	47,708.00	1,813.00	3.95%
001.2030.5020.040	OVERTIME-PPME UNION	34.84	0.00	323.77	500.00	0.00	-500.00	-100.00%
001.2030.5101.010	SOCIAL SECURITY-NON UNION	488.31	540.00	332.75	540.00	571.00	31.00	5.74%
001.2030.5101.040	SOCIAL SECURITY-PPME UNION	1,330.03	2,735.00	1,198.30	2,846.00	2,958.00	112.00	3.94%
001.2030.5102.010	MEDICARE-NON UNION	114.27	126.00	77.89	126.00	133.00	7.00	5.56%
001.2030.5102.040	MEDICARE-PPME UNION	311.15	640.00	280.20	665.00	692.00	27.00	4.06%
001.2030.5111.010	IPERS-NON UNION	742.23	823.00	504.67	823.00	869.00	46.00	5.59%
001.2030.5111.040	IPERS-PPME UNION	2,238.15	4,164.00	1,973.30	4,333.00	4,504.00	171.00	3.95%
001.2030.5121.040	GRP INSUR-PPME UNION	6,795.80	15,651.00	5,535.88	13,089.00	17,999.00	4,910.00	37.51%
001.2030.5122.000	RETIREEES GRP HLTH INS	398.91	442.00	0.00	0.00	0.00	0.00	0.00%
001.2030.5123.010	WORKCOMP-NON UNION	321.55	427.00	190.04	310.00	327.00	17.00	5.48%
001.2030.5123.040	WORKCOMP-PPME UNION	1,011.76	2,162.00	745.01	1,631.00	1,696.00	65.00	3.99%
001.2030.5151.000	PHYSICALS/IMMUNIZATIONS	6.50	0.00	10.37	20.00	0.00	-20.00	-100.00%
001.2030.5290.000	INSURANCE - GENERAL	2,029.58	2,195.00	0.00	2,233.00	2,456.00	223.00	9.99%
001.2030.5300.000	INSURANCE - TORT LIAB	1,324.21	1,671.00	0.00	1,457.00	1,602.00	145.00	9.95%
001.2040.5010.010	REGULAR-NON UNION	8,001.05	8,717.00	5,429.13	8,717.00	9,203.00	486.00	5.58%
001.2040.5010.040	REGULAR-PPME UNION	26,529.20	44,108.00	36,689.18	45,895.00	47,708.00	1,813.00	3.95%
001.2040.5020.010	OVERTIME-NON UNION	106.18	0.00	0.00	0.00	0.00	0.00	0.00%
001.2040.5020.040	OVERTIME-PPME UNION	34.84	0.00	915.82	1,600.00	0.00	-1,600.00	-100.00%
001.2040.5020.070	OVERTIME-TEMPORARY	75.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.2040.5030.070	PART-TIME TEMPORARY	3,675.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.2040.5101.010	SOCIAL SECURITY-NON UNION	503.50	540.00	337.65	540.00	571.00	31.00	5.74%
001.2040.5101.040	SOCIAL SECURITY-PPME UNION	1,489.00	2,735.00	2,189.95	2,846.00	2,958.00	112.00	3.94%
001.2040.5101.070	SOCIAL SECURITY-PT TEMP	232.50	0.00	0.00	0.00	0.00	0.00	0.00%
001.2040.5102.010	MEDICARE-NON UNION	117.83	126.00	79.04	126.00	133.00	7.00	5.56%
001.2040.5102.040	MEDICARE-PPME UNION	348.34	640.00	512.14	665.00	692.00	27.00	4.06%
001.2040.5102.070	MEDICARE-TEMPORARY	54.38	0.00	0.00	0.00	0.00	0.00	0.00%
001.2040.5111.010	IPERS-NON UNION	765.36	823.00	512.46	823.00	869.00	46.00	5.59%
001.2040.5111.040	IPERS-PPME UNION	2,507.71	4,164.00	3,549.89	4,333.00	4,504.00	171.00	3.95%
001.2040.5121.010	GRP INSUR-NON UNION	0.00	0.00	19.42	0.00	0.00	0.00	0.00%
001.2040.5121.040	GRP INSUR-PPME UNION	8,434.71	15,651.00	9,575.92	13,089.00	17,999.00	4,910.00	37.51%
001.2040.5122.000	RETIREEES GRP HLTH INS	2,393.39	2,693.00	0.00	0.00	0.00	0.00	0.00%
001.2040.5123.010	WORKCOMP-NON UNION	329.55	427.00	192.99	310.00	327.00	17.00	5.48%
001.2040.5123.040	WORKCOMP-PPME UNION	1,171.18	2,162.00	1,348.30	1,631.00	1,696.00	65.00	3.99%
001.2040.5123.070	WORKCOMP-TEMPORARY	153.38	0.00	0.00	0.00	0.00	0.00	0.00%
001.2040.5151.000	PHYSICALS/IMMUNIZATIONS	45.24	0.00	62.23	80.00	0.00	-80.00	-100.00%
001.2040.5290.000	INSURANCE - GENERAL	10,724.91	13,240.00	0.00	11,797.00	12,977.00	1,180.00	10.00%
001.2040.5300.000	INSURANCE - TORT LIAB	649.86	1,526.00	0.00	715.00	786.00	71.00	9.93%
001.2050.5010.010	REGULAR-NON UNION	631.77	0.00	112.62	0.00	0.00	0.00	0.00%

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001.2050.5010.040	REGULAR-PPME UNION	65,030.90	0.00	14,521.48	0.00	0.00	0.00	0.00%
001.2050.5010.090	REGULAR-P&R UNION	6,049.83	0.00	4,445.94	0.00	0.00	0.00	0.00%
001.2050.5020.010	OVERTIME-NON UNION	1,543.32	0.00	0.00	0.00	0.00	0.00	0.00%
001.2050.5020.040	OVERTIME-PPME UNION	13,875.43	40,000.00	918.15	40,000.00	40,000.00	0.00	0.00%
001.2050.5101.010	SOCIAL SECURITY-NON UNION	128.23	0.00	6.98	0.00	0.00	0.00	0.00%
001.2050.5101.040	SOCIAL SECURITY-PPME UNION	4,609.58	3,060.00	914.17	3,060.00	2,480.00	-580.00	-18.95%
001.2050.5101.090	SOCIAL SECURITY-P&R UNION	334.29	0.00	254.40	0.00	0.00	0.00	0.00%
001.2050.5102.010	MEDICARE-NON UNION	29.98	0.00	1.63	0.00	0.00	0.00	0.00%
001.2050.5102.040	MEDICARE-PPME UNION	1,078.11	580.00	213.75	580.00	580.00	0.00	0.00%
001.2050.5102.090	MEDICARE-P&R UNION	78.19	0.00	59.49	0.00	0.00	0.00	0.00%
001.2050.5111.010	IPERS-NON UNION	205.33	0.00	10.63	0.00	0.00	0.00	0.00%
001.2050.5111.040	IPERS-PPME UNION	7,448.81	0.00	1,457.52	0.00	3,776.00	3,776.00	0.00%
001.2050.5111.090	IPERS-P&R UNION	571.12	0.00	419.70	0.00	0.00	0.00	0.00%
001.2050.5121.010	GRP INSUR-NON UNION	316.41	0.00	0.00	0.00	0.00	0.00	0.00%
001.2050.5121.040	GRP INSUR-PPME UNION	23,610.55	0.00	4,185.34	0.00	0.00	0.00	0.00%
001.2050.5121.090	GRP INSUR-P&R UNION	2,513.39	0.00	1,121.06	0.00	0.00	0.00	0.00%
001.2050.5123.010	WORKCOMP-NON UNION	85.11	0.00	3.73	0.00	0.00	0.00	0.00%
001.2050.5123.040	WORKCOMP-PPME UNION	3,090.43	0.00	510.77	0.00	1,323.00	1,323.00	0.00%
001.2050.5123.090	WORKCOMP-P&R UNION	236.67	0.00	147.07	0.00	0.00	0.00	0.00%
001.2050.5300.000	INSURANCE - TORT LIAB	1,425.00	1,778.00	0.00	1,568.00	1,724.00	156.00	9.95%
001.2050.5565.000	VEHICLE OPER/MAINT SPPLY	698.45	0.00	3,083.85	3,100.00	0.00	-3,100.00	-100.00%
001.2055.5010.010	REGULAR-NON UNION	2,982.30	0.00	1,941.00	0.00	0.00	0.00	0.00%
001.2055.5101.010	SOCIAL SECURITY-NON UNION	174.41	0.00	113.57	0.00	0.00	0.00	0.00%
001.2055.5102.010	MEDICARE-NON UNION	40.80	0.00	26.54	0.00	0.00	0.00	0.00%
001.2055.5111.010	IPERS-NON UNION	281.60	0.00	183.27	0.00	0.00	0.00	0.00%
001.2055.5121.010	GRP INSUR-NON UNION	784.98	0.00	513.77	0.00	0.00	0.00	0.00%
001.2055.5123.010	WORKCOMP-NON UNION	83.93	0.00	46.02	0.00	0.00	0.00	0.00%
001.2060.5010.010	REGULAR-NON UNION	224,252.98	317,094.00	122,468.87	256,265.00	318,128.00	61,863.00	24.14%
001.2060.5020.010	OVERTIME-NON UNION	10.41	0.00	0.00	0.00	0.00	0.00	0.00%
001.2060.5030.070	PART-TIME TEMPORARY	7,713.00	15,000.00	5,328.00	15,000.00	15,000.00	0.00	0.00%
001.2060.5060.010	TERM PAYOUTS-NON UNION	1,969.71	0.00	0.00	0.00	0.00	0.00	0.00%
001.2060.5101.010	SOCIAL SECURITY-NON UNION	13,469.30	19,660.00	7,291.88	15,888.00	19,724.00	3,836.00	24.14%
001.2060.5101.070	SOCIAL SECURITY-PT TEMP	478.24	930.00	330.34	930.00	930.00	0.00	0.00%
001.2060.5102.010	MEDICARE-NON UNION	3,150.16	4,598.00	1,705.45	3,716.00	4,613.00	897.00	24.14%
001.2060.5102.070	MEDICARE-TEMPORARY	111.86	218.00	77.24	218.00	218.00	0.00	0.00%
001.2060.5111.010	IPERS-NON UNION	21,170.70	29,934.00	11,561.16	24,191.00	30,031.00	5,840.00	24.14%
001.2060.5111.070	IPERS-PT TEMP	728.11	661.00	502.94	661.00	661.00	0.00	0.00%
001.2060.5121.010	GRP INSUR-NON UNION	46,148.87	76,389.00	23,872.97	61,350.00	93,329.00	31,979.00	52.13%
001.2060.5123.010	WORKCOMP-NON UNION	3,932.64	5,717.00	1,780.78	3,893.00	4,962.00	1,069.00	27.46%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.2060.5123.070	WORKCOMP-TEMPORARY	92.79	25.00	8.26	23.00	23.00	0.00	0.00%
001.2060.5230.000	CONSULTING & PROF FEES	0.00	3,500.00	225.00	3,500.00	3,500.00	0.00	0.00%
001.2060.5290.000	INSURANCE - GENERAL	3,877.53	4,088.00	0.00	4,265.00	4,692.00	427.00	10.01%
001.2060.5300.000	INSURANCE - TORT LIAB	1,795.03	3,798.00	0.00	1,975.00	2,172.00	197.00	9.97%
001.2060.5344.000	CONTRACT-MAINTENANCE	271.65	250.00	0.00	250.00	250.00	0.00	0.00%
001.2060.5360.000	POSTAGE & SHIPPING	0.00	50.00	0.00	50.00	50.00	0.00	0.00%
001.2060.5600.000	OPERATING SUPPLIES	0.00	0.00	27.37	150.00	150.00	0.00	0.00%
001.2060.5605.000	OFFICE SUPPLIES	39.25	0.00	0.00	150.00	150.00	0.00	0.00%
001.2080.5251.000	LICENSE & PERMITS	134.79	135.00	0.00	135.00	840.00	705.00	522.22%
001.2080.5290.000	INSURANCE - GENERAL	29,563.96	38,613.00	4,902.00	37,422.00	41,165.00	3,743.00	10.00%
001.2080.5300.000	INSURANCE - TORT LIAB	529.00	474.00	0.00	582.00	640.00	58.00	9.97%
001.2080.5342.000	CONTRACT-OUTSIDE HELP	29,422.00	33,621.00	18,967.01	33,621.00	35,121.00	1,500.00	4.46%
001.2080.5344.000	CONTRACT-MAINTENANCE	29,007.00	30,000.00	15,410.00	30,000.00	30,000.00	0.00	0.00%
001.2080.5410.000	REPAIRS & MAINTENANCE	8,392.22	15,000.00	1,378.36	15,000.00	15,000.00	0.00	0.00%
001.2080.5450.000	TELEPHONE/OTHR COMMNCTI	360.60	450.00	210.35	450.00	450.00	0.00	0.00%
001.2080.5481.000	ELECTRICITY	7,541.55	10,840.00	6,026.69	10,840.00	11,815.00	975.00	8.99%
001.2080.5483.000	WATER	1,856.84	2,200.00	1,209.21	2,200.00	2,420.00	220.00	10.00%
001.2080.5484.000	PROPANE	12,838.52	13,800.00	13,301.68	13,800.00	14,352.00	552.00	4.00%
001.2080.5565.000	VEHICLE OPER/MAINT SPPLY	1,141.78	2,200.00	314.74	2,200.00	2,200.00	0.00	0.00%
001.2080.5571.000	VEHICLE DIESEL FUEL	4,051.56	6,500.00	1,948.73	6,500.00	6,500.00	0.00	0.00%
001.2080.5600.000	OPERATING SUPPLIES	1,549.07	3,000.00	1,129.93	3,000.00	3,000.00	0.00	0.00%
001.2080.5611.000	BLDG,GRD OPER/MAINT SPLY	859.36	250.00	211.00	500.00	500.00	0.00	0.00%
001.2080.5718.000	MINOR EQUIP, UNCLASSIFIED	12.98	50.00	0.00	50.00	50.00	0.00	0.00%
001.2080.5776.000	BUILDINGS & IMPROVEMENTS	41.72	2,000.00	0.00	2,000.00	2,000.00	0.00	0.00%
001.2090.5220.000	COLLECTION COSTS/REFUNDS	3,051.75	3,500.00	1,798.55	3,500.00	3,500.00	0.00	0.00%
001.2090.5331.000	PAYMENTS-OTHER ENTITIES	110,364.00	110,208.00	55,182.00	110,364.00	110,208.00	-156.00	-0.14%
001.2095.5616.000	MOSQUITO SPRAYING	0.00	4,000.00	0.00	4,000.00	2,000.00	-2,000.00	-50.00%
001.4010.5010.010	REGULAR-NON UNION	547,806.94	612,838.00	360,998.12	602,128.00	638,853.00	36,725.00	6.10%
001.4010.5020.010	OVERTIME-NON UNION	889.95	0.00	202.99	0.00	0.00	0.00	0.00%
001.4010.5050.060	PART-TIME REGULAR	214,592.08	307,238.00	144,857.97	266,302.00	270,250.00	3,948.00	1.48%
001.4010.5060.010	TERM PAYOUTS-NON UNION	4,254.76	0.00	230.70	231.00	0.00	-231.00	-100.00%
001.4010.5060.060	TERM PAYOUTS-PT REG	179.52	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5061.010	RHSA PAYOUTS-NON UNION	0.00	0.00	0.00	0.00	10,239.00	10,239.00	0.00%
001.4010.5101.010	SOCIAL SECURITY-NON UNION	32,914.84	37,996.00	21,519.31	37,332.00	39,609.00	2,277.00	6.10%
001.4010.5101.060	SOCIAL SECURITY-PT REGULAR	13,315.87	19,049.00	8,981.27	16,511.00	16,756.00	245.00	1.48%
001.4010.5102.010	MEDICARE-NON UNION	7,697.74	8,886.00	5,032.76	8,731.00	9,263.00	532.00	6.09%
001.4010.5102.060	MEDICARE-PT REGULAR	3,114.14	4,455.00	2,100.38	3,861.00	3,919.00	58.00	1.50%
001.4010.5111.010	IPERS-NON UNION	51,796.97	57,852.00	33,834.35	56,841.00	60,308.00	3,467.00	6.10%
001.4010.5111.060	IPERS-PT REGULAR	20,064.51	29,003.00	13,017.83	25,139.00	25,512.00	373.00	1.48%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Comparison 1 Budget		Comparison 1 to Parent Budget	
					Parent Budget 2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	%
001.4010.5121.010	GRP INSUR-NON UNION	84,625.76	100,769.00	59,438.84	111,851.00	123,752.00	11,901.00	10.64%
001.4010.5122.000	RETIREES GRP HLTH INS	4,883.02	4,474.00	2,748.99	4,474.00	4,474.00	0.00	0.00%
001.4010.5123.010	WORKCOMP-NON UNION	933.86	1,035.00	560.65	933.00	990.00	57.00	6.11%
001.4010.5123.060	WORKCOMP-PT REGULAR	398.47	519.00	224.36	413.00	419.00	6.00	1.45%
001.4010.5151.000	PHYSICALS/IMMUNIZATIONS	601.00	800.00	418.56	800.00	800.00	0.00	0.00%
001.4010.5210.000	ADVERTISING & LEGAL PUB	742.90	200.00	339.72	200.00	200.00	0.00	0.00%
001.4010.5215.000	BANK CHARGES	2,679.75	700.00	1,025.48	700.00	700.00	0.00	0.00%
001.4010.5216.000	BACKGROUND CHECKS	108.00	120.00	87.00	120.00	120.00	0.00	0.00%
001.4010.5251.000	LICENSE & PERMITS	0.00	750.00	0.00	750.00	750.00	0.00	0.00%
001.4010.5280.000	DUES, MEMBER, SUBSCRIPTN	901.00	1,600.00	2,914.45	1,600.00	1,600.00	0.00	0.00%
001.4010.5290.000	INSURANCE - GENERAL	31,450.34	38,734.00	0.00	34,595.00	38,055.00	3,460.00	10.00%
001.4010.5300.000	INSURANCE - TORT LIAB	6,158.54	8,165.00	0.00	6,774.00	7,452.00	678.00	10.01%
001.4010.5342.000	CONTRACT-OUTSIDE HELP	32,018.55	28,600.00	19,363.41	28,600.00	28,600.00	0.00	0.00%
001.4010.5343.000	CONTRACT-PROMOTIONS/PGM	4,596.11	6,500.00	2,121.40	6,500.00	6,500.00	0.00	0.00%
001.4010.5344.000	CONTRACT-MAINTENANCE	24,368.84	20,000.00	12,584.51	20,000.00	20,000.00	0.00	0.00%
001.4010.5347.000	CONTRACT-SOFTWARE MAINT	10,755.56	15,000.00	28,687.35	35,000.00	35,000.00	0.00	0.00%
001.4010.5360.000	POSTAGE & SHIPPING	47.05	2,000.00	18.85	2,500.00	3,000.00	500.00	20.00%
001.4010.5370.000	PRINTING & BINDING	62.41	300.00	0.00	300.00	300.00	0.00	0.00%
001.4010.5380.000	RENTS & LEASES	60.00	400.00	491.00	400.00	400.00	0.00	0.00%
001.4010.5386.000	CONTRACT LAWN CARE	4,655.80	4,400.00	2,805.00	4,400.00	4,400.00	0.00	0.00%
001.4010.5410.000	REPAIRS & MAINTENANCE	31,801.11	9,000.00	10,577.85	9,000.00	9,000.00	0.00	0.00%
001.4010.5450.000	TELEPHONE/OTHR COMMNCTI	4,944.76	6,800.00	2,461.77	6,800.00	6,800.00	0.00	0.00%
001.4010.5460.000	CONFERENCE EXPENSE	244.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.4010.5462.000	TRAVEL-OTHER	21.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5464.000	TRAVEL-PER DIEM	13.07	200.00	0.00	200.00	200.00	0.00	0.00%
001.4010.5465.000	TRAVEL - HOTEL/MOTEL	983.15	500.00	0.00	500.00	500.00	0.00	0.00%
001.4010.5470.000	TRAINING	991.50	0.00	974.00	0.00	0.00	0.00	0.00%
001.4010.5472.000	MILEAGE REIMBURSE	49.10	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5481.000	ELECTRICITY	35,529.03	49,500.00	26,668.98	49,500.00	49,500.00	0.00	0.00%
001.4010.5482.000	NATURAL GAS	6,976.77	10,500.00	4,423.82	10,500.00	10,500.00	0.00	0.00%
001.4010.5485.000	STORM WATER FEES	0.00	1,101.00	2,256.62	2,257.00	0.00	-2,257.00	-100.00%
001.4010.5565.000	VEHICLE OPER/MAINT SPPLY	1,436.28	2,000.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5570.000	VEHICLE GAS	90.95	5,000.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5600.000	OPERATING SUPPLIES	30,085.55	24,000.00	6,403.36	24,000.00	24,000.00	0.00	0.00%
001.4010.5601.000	PROMOTION/PROGRAM SPPLY	1,896.35	2,500.00	609.30	2,500.00	2,500.00	0.00	0.00%
001.4010.5605.000	OFFICE SUPPLIES	3,473.88	1,500.00	907.46	1,500.00	1,500.00	0.00	0.00%
001.4010.5611.000	BLDG,GRD OPER/MAINT SPLY	575.06	1,500.00	202.82	1,500.00	1,500.00	0.00	0.00%
001.4010.5612.000	COMPUTER COMPONENTS	1,449.59	500.00	320.87	500.00	500.00	0.00	0.00%
001.4010.5702.000	MINOR OFFICE FURN/EQUIP	1,218.00	0.00	0.00	0.00	0.00	0.00	0.00%

Budget Comparison Report

Account Number		Comparison 1						
		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.4010.5703.000	MINOR COMPUTER	16,643.74	7,000.00	216.91	7,000.00	7,000.00	0.00	0.00%
001.4010.5704.000	MINOR SOFTWARE <\$5,000	889.00	0.00	3,514.00	2,000.00	2,000.00	0.00	0.00%
001.4010.5718.000	MINOR EQUIP, UNCLASSIFIED	9,731.24	13,930.00	567.25	13,930.00	10,000.00	-3,930.00	-28.21%
001.4010.5730.000	REFERENCE MATERIALS	8,429.70	8,500.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5731.000	LIBRARY PERIODICALS	5,386.21	9,000.00	3,690.40	6,000.00	6,000.00	0.00	0.00%
001.4010.5732.000	LIBRARY BOOKS, FILM RCRD	114,069.70	0.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5733.000	INTER-LIBRARY LOAN BOOKS	18.95	0.00	78.23	100.00	100.00	0.00	0.00%
001.4010.5734.000	LOST BOOKS	5,704.44	4,100.00	0.00	0.00	0.00	0.00	0.00%
001.4010.5736.000	LIBRARY DATABASES	16,277.51	24,000.00	11,657.71	20,000.00	20,000.00	0.00	0.00%
001.4010.5741.000	COMPUTER SOFTWARE > 5,000	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00%
001.4010.5980.000	REFUNDS/REIMB	405.34	0.00	266.76	0.00	0.00	0.00	0.00%
001.4010.5990.000	CASH SHORT & (OVER)	-10.65	0.00	-0.80	0.00	0.00	0.00	0.00%
001.4020.5331.000	PAYMENTS-OTHER ENTITIES	9,571.76	0.00	0.00	0.00	0.00	0.00	0.00%
001.4030.5010.010	REGULAR-NON UNION	126,692.55	137,661.00	73,311.06	128,806.00	144,674.00	15,868.00	12.32%
001.4030.5010.090	REGULAR-P&R UNION	175,178.75	219,272.00	124,229.30	219,146.00	230,456.00	11,310.00	5.16%
001.4030.5020.010	OVERTIME-NON UNION	0.00	0.00	160.20	0.00	0.00	0.00	0.00%
001.4030.5020.090	OVERTIME-P&R UNION	1,383.11	1,000.00	12.52	1,000.00	1,000.00	0.00	0.00%
001.4030.5030.070	PART-TIME TEMPORARY	38,979.34	28,000.00	20,692.39	28,000.00	28,000.00	0.00	0.00%
001.4030.5050.060	PART-TIME REGULAR	362.88	24,840.00	10,417.08	25,169.00	25,956.00	787.00	3.13%
001.4030.5056.040	OTHR DEPT-PPME UNION	679.37	0.00	606.91	0.00	0.00	0.00	0.00%
001.4030.5060.010	TERM PAYOUTS-NON UNION	0.00	0.00	2,229.19	2,229.00	0.00	-2,229.00	-100.00%
001.4030.5060.090	TERM PAYOUTS-P&R UNION	2,620.86	0.00	0.00	0.00	0.00	0.00	0.00%
001.4030.5061.010	RHSA PAYOUTS-NON UNION	0.00	0.00	0.00	4,963.00	0.00	-4,963.00	-100.00%
001.4030.5101.010	SOCIAL SECURITY-NON UNION	7,509.90	8,535.00	4,512.43	7,986.00	8,970.00	984.00	12.32%
001.4030.5101.040	SOCIAL SECURITY-PPME UNION	40.03	0.00	36.33	0.00	0.00	0.00	0.00%
001.4030.5101.060	SOCIAL SECURITY-PT REGULAR	24.67	1,540.00	645.87	1,560.00	1,609.00	49.00	3.14%
001.4030.5101.070	SOCIAL SECURITY-PT TEMP	2,416.71	1,736.00	1,282.93	1,736.00	1,736.00	0.00	0.00%
001.4030.5101.090	SOCIAL SECURITY-P&R UNION	10,087.94	13,595.00	7,094.76	13,587.00	14,350.00	763.00	5.62%
001.4030.5102.010	MEDICARE-NON UNION	1,756.46	1,996.00	1,055.38	1,868.00	2,098.00	230.00	12.31%
001.4030.5102.040	MEDICARE-PPME UNION	9.35	0.00	8.51	0.00	0.00	0.00	0.00%
001.4030.5102.060	MEDICARE-PT REGULAR	5.77	360.00	151.06	365.00	376.00	11.00	3.01%
001.4030.5102.070	MEDICARE-TEMPORARY	565.23	406.00	300.03	406.00	406.00	0.00	0.00%
001.4030.5102.090	MEDICARE-P&R UNION	2,359.18	3,179.00	1,659.37	3,178.00	3,356.00	178.00	5.60%
001.4030.5111.010	IPERS-NON UNION	11,959.74	12,995.00	6,935.56	12,159.00	13,657.00	1,498.00	12.32%
001.4030.5111.040	IPERS-PPME UNION	64.13	0.00	57.30	0.00	0.00	0.00	0.00%
001.4030.5111.060	IPERS-PT REGULAR	-18.39	2,345.00	983.37	2,376.00	2,450.00	74.00	3.11%
001.4030.5111.070	IPERS-PT TEMP	890.15	1,113.00	248.46	1,113.00	0.00	-1,113.00	-100.00%
001.4030.5111.090	IPERS-P&R UNION	16,667.29	20,699.00	11,728.39	20,687.00	21,849.00	1,162.00	5.62%
001.4030.5121.010	GRP INSUR-NON UNION	27,067.96	33,655.00	14,105.04	32,668.00	38,703.00	6,035.00	18.47%

Budget Comparison Report

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					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.4030.5121.040	GRP INSUR-PPME UNION	252.64	0.00	140.40	0.00	0.00	0.00	0.00%
001.4030.5121.090	GRP INSUR-P&R UNION	60,754.32	94,857.00	36,383.48	92,701.00	109,086.00	16,385.00	17.68%
001.4030.5122.000	RETIREES GRP HLTH INS	15,024.88	16,091.00	8,789.71	16,091.00	16,091.00	0.00	0.00%
001.4030.5123.010	WORKCOMP-NON UNION	2,076.66	3,102.00	1,163.70	2,534.00	2,837.00	303.00	11.96%
001.4030.5123.040	WORKCOMP-PPME UNION	15.88	0.00	13.16	0.00	0.00	0.00	0.00%
001.4030.5123.060	WORKCOMP-PT REGULAR	9.45	680.00	226.92	596.00	615.00	19.00	3.19%
001.4030.5123.070	WORKCOMP-TEMPORARY	1,031.21	767.00	490.31	663.00	663.00	0.00	0.00%
001.4030.5123.090	WORKCOMP-P&R UNION	5,186.27	6,005.00	2,943.71	5,192.00	5,484.00	292.00	5.62%
001.4030.5132.000	CLOTHING EXPENSE	1,886.59	2,000.00	1,303.26	2,000.00	2,000.00	0.00	0.00%
001.4030.5132.010	CLOTHING EXPENSES NON UNIK	312.47	200.00	0.00	200.00	200.00	0.00	0.00%
001.4030.5151.000	PHYSICALS/IMMUNIZATIONS	866.00	500.00	38.72	500.00	500.00	0.00	0.00%
001.4030.5192.070	UNEMPLOYMENT-TEMPORARY	0.00	3,000.00	0.00	1,000.00	1,000.00	0.00	0.00%
001.4030.5215.000	BANK CHARGES	-4,364.82	5,000.00	6,426.48	5,000.00	5,000.00	0.00	0.00%
001.4030.5216.000	BACKGROUND CHECKS	0.00	150.00	0.00	150.00	150.00	0.00	0.00%
001.4030.5230.000	CONSULTING & PROF FEES	0.00	4,000.00	750.00	4,000.00	4,000.00	0.00	0.00%
001.4030.5231.000	ACCOUNTING FEES	16.50	0.00	61.39	62.00	0.00	-62.00	-100.00%
001.4030.5233.000	ENGINEERING FEES	1,260.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.4030.5251.000	LICENSE & PERMITS	820.00	500.00	2,876.50	3,000.00	3,000.00	0.00	0.00%
001.4030.5280.000	DUES, MEMBER, SUBSCRIPTN	495.00	500.00	236.08	500.00	500.00	0.00	0.00%
001.4030.5290.000	INSURANCE - GENERAL	27,220.36	29,658.00	0.00	29,942.00	32,937.00	2,995.00	10.00%
001.4030.5300.000	INSURANCE - TORT LIAB	8,048.31	10,705.00	0.00	8,853.00	9,738.00	885.00	10.00%
001.4030.5339.000	MEDICAL CLAIMS PAID BY CITY	224.90	200.00	203.44	200.00	200.00	0.00	0.00%
001.4030.5342.000	CONTRACT-OUTSIDE HELP	19,387.86	17,500.00	13,567.47	21,000.00	21,000.00	0.00	0.00%
001.4030.5344.000	CONTRACT-MAINTENANCE	2,461.61	1,900.00	2,319.34	2,500.00	2,500.00	0.00	0.00%
001.4030.5360.000	POSTAGE & SHIPPING	206.90	50.00	0.00	400.00	400.00	0.00	0.00%
001.4030.5370.000	PRINTING & BINDING	0.00	350.00	0.00	350.00	350.00	0.00	0.00%
001.4030.5380.000	RENTS & LEASES	587.00	1,000.00	698.00	1,000.00	1,000.00	0.00	0.00%
001.4030.5386.000	CONTRACT LAWN CARE	27,899.00	36,400.00	21,415.00	32,000.00	32,000.00	0.00	0.00%
001.4030.5410.000	REPAIRS & MAINTENANCE	2,590.47	4,000.00	3,206.71	4,000.00	4,000.00	0.00	0.00%
001.4030.5450.000	TELEPHONE/OTHR COMMNCTI	561.33	500.00	436.71	670.00	500.00	-170.00	-25.37%
001.4030.5460.000	CONFERENCE EXPENSE	1,015.00	1,000.00	624.00	1,000.00	1,000.00	0.00	0.00%
001.4030.5463.000	TRAVEL-MOVING REIMBRSMT	0.00	0.00	0.00	5,000.00	0.00	-5,000.00	-100.00%
001.4030.5465.000	TRAVEL- HOTEL/MOTEL	399.84	350.00	221.76	350.00	350.00	0.00	0.00%
001.4030.5475.000	RECRUITING EXPENSES	0.00	0.00	144.48	0.00	0.00	0.00	0.00%
001.4030.5481.000	ELECTRICITY	14,645.05	25,000.00	10,019.22	20,000.00	20,000.00	0.00	0.00%
001.4030.5482.000	NATURAL GAS	2,938.78	3,600.00	3,278.02	3,600.00	3,600.00	0.00	0.00%
001.4030.5483.000	WATER	0.00	1,200.00	5,212.30	9,200.00	9,200.00	0.00	0.00%
001.4030.5485.000	STORM WATER FEES	0.00	6,120.00	25,187.61	31,554.00	0.00	-31,554.00	-100.00%
001.4030.5488.000	SEWER	0.00	0.00	5,371.45	9,500.00	0.00	-9,500.00	-100.00%

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					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.4030.5489.000	SAFETY EQUIP/SUPPLIES	394.16	500.00	264.96	500.00	500.00	0.00	0.00%
001.4030.5562.000	GROUNDS EQUIP MAINT SPLY	128.44	1,500.00	5,970.72	1,500.00	1,500.00	0.00	0.00%
001.4030.5565.000	VEHICLE OPER/MAINT SPLY	8,654.77	10,000.00	7,433.82	10,000.00	10,000.00	0.00	0.00%
001.4030.5570.000	VEHICLE GAS	9,866.36	10,000.00	5,946.49	10,000.00	10,000.00	0.00	0.00%
001.4030.5571.000	VEHICLE DIESEL FUEL	4,501.87	5,000.00	2,621.48	5,000.00	5,000.00	0.00	0.00%
001.4030.5600.000	OPERATING SUPPLIES	9,223.87	5,500.00	1,575.71	5,500.00	5,500.00	0.00	0.00%
001.4030.5605.000	OFFICE SUPPLIES	0.00	0.00	53.79	0.00	0.00	0.00	0.00%
001.4030.5609.000	AGRICULTURAL SUPPLIES	2,070.10	1,300.00	69.97	1,300.00	1,300.00	0.00	0.00%
001.4030.5611.000	BLDG,GRD OPER/MAINT SPLY	6,450.97	11,000.00	4,662.75	11,000.00	11,000.00	0.00	0.00%
001.4030.5703.000	MINOR COMPUTER	1,071.83	0.00	0.00	0.00	0.00	0.00	0.00%
001.4030.5718.000	MINOR EQUIP, UNCLASSIFIED	2,444.65	3,000.00	69.98	3,000.00	3,000.00	0.00	0.00%
001.4030.5776.000	BUILDINGS & IMPROVEMENTS	246.61	0.00	205.72	50.00	50.00	0.00	0.00%
001.4030.5980.000	REFUNDS/REIMB	1,265.00	1,500.00	1,050.00	1,500.00	1,500.00	0.00	0.00%
001.4040.5010.010	REGULAR-NON UNION	119,962.48	127,060.00	53,003.76	106,848.00	133,476.00	26,628.00	24.92%
001.4040.5020.010	OVERTIME-NON UNION	0.00	0.00	160.19	0.00	0.00	0.00	0.00%
001.4040.5060.010	TERM PAYOUTS-NON UNION	0.00	0.00	6,241.71	6,242.00	0.00	-6,242.00	-100.00%
001.4040.5061.010	RHSA PAYOUTS-NON UNION	0.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.4040.5101.010	SOCIAL SECURITY-NON UNION	7,190.98	7,878.00	3,639.70	6,625.00	8,276.00	1,651.00	24.92%
001.4040.5102.010	MEDICARE-NON UNION	1,681.79	1,842.00	851.24	1,549.00	1,935.00	386.00	24.92%
001.4040.5111.010	IPERS-NON UNION	11,324.59	11,995.00	5,018.67	10,086.00	12,600.00	2,514.00	24.93%
001.4040.5121.010	GRP INSUR-NON UNION	20,002.45	24,169.00	2,842.79	18,184.00	27,795.00	9,611.00	52.85%
001.4040.5123.010	WORKCOMP-NON UNION	554.61	2,816.00	286.34	2,016.00	2,574.00	558.00	27.68%
001.4040.5132.000	CLOTHING EXPENSE	0.00	200.00	0.00	200.00	200.00	0.00	0.00%
001.4040.5210.000	ADVERTISING & LEGAL PUB	274.91	300.00	0.00	300.00	300.00	0.00	0.00%
001.4040.5216.000	BACKGROUND CHECKS	181.00	50.00	33.50	50.00	50.00	0.00	0.00%
001.4040.5230.000	CONSULTING & PROF FEES	0.00	275.00	0.00	275.00	275.00	0.00	0.00%
001.4040.5280.000	DUES, MEMBER, SUBSCRIPTN	180.00	750.00	359.27	750.00	750.00	0.00	0.00%
001.4040.5344.000	CONTRACT-MAINTENANCE	4,500.00	4,500.00	110.00	4,500.00	4,500.00	0.00	0.00%
001.4040.5357.000	RECR SRV-ADMISSION	0.00	0.00	280.00	280.00	280.00	0.00	0.00%
001.4040.5358.000	RECR SRV-INSTRUCTR	5,925.00	8,000.00	4,500.00	8,000.00	8,000.00	0.00	0.00%
001.4040.5360.000	POSTAGE & SHIPPING	126.00	100.00	10.45	100.00	100.00	0.00	0.00%
001.4040.5370.000	PRINTING & BINDING	0.00	400.00	0.00	400.00	400.00	0.00	0.00%
001.4040.5380.000	RENTS & LEASES	560.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.4040.5410.000	REPAIRS & MAINTENANCE	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.4040.5441.000	SALES TAXES PAID/RECEIVED	-1,000.91	2,400.00	2,697.76	2,400.00	2,400.00	0.00	0.00%
001.4040.5442.000	LOST TAXES PAID/RECEIVED	-148.07	250.00	366.58	250.00	250.00	0.00	0.00%
001.4040.5443.000	WATER EXCISE TAX	-2.31	750.00	38.43	750.00	750.00	0.00	0.00%
001.4040.5450.000	TELEPHONE/OTHR COMMNCTI	520.92	500.00	175.76	500.00	500.00	0.00	0.00%
001.4040.5460.000	CONFERENCE EXPENSE	0.00	1,250.00	224.28	1,250.00	1,250.00	0.00	0.00%

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001.4040.5463.000	TRAVEL-MOVING REIMBRSM	0.00	0.00	0.00	5,000.00	0.00	-5,000.00	-100.00%
001.4040.5600.000	OPERATING SUPPLIES	1,889.53	1,000.00	903.17	1,000.00	1,000.00	0.00	0.00%
001.4040.5601.000	PROMOTION/PROGRAM SPPLY	0.00	400.00	348.29	400.00	400.00	0.00	0.00%
001.4040.5605.000	OFFICE SUPPLIES	0.00	500.00	131.56	500.00	500.00	0.00	0.00%
001.4040.5718.000	MINOR EQUIP, UNCLASSIFIED	0.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.4040.5980.000	REFUNDS/REIMB	1,143.00	750.00	419.01	750.00	750.00	0.00	0.00%
001.4040.5990.000	CASH SHORT & (OVER)	-1.00	0.00	-10.00	0.00	0.00	0.00	0.00%
001.4041.5010.010	REGULAR-NON UNION	86,808.99	94,258.00	57,676.21	92,985.00	99,177.00	6,192.00	6.66%
001.4041.5020.070	OVERTIME-TEMPORARY	0.00	0.00	74.44	0.00	0.00	0.00	0.00%
001.4041.5030.070	PART-TIME TEMPORARY	58,242.04	75,000.00	65,514.82	75,000.00	75,000.00	0.00	0.00%
001.4041.5101.010	SOCIAL SECURITY-NON UNION	5,008.87	5,844.00	3,341.95	5,765.00	6,149.00	384.00	6.66%
001.4041.5101.070	SOCIAL SECURITY-PT TEMP	3,611.90	4,650.00	4,066.62	4,650.00	4,650.00	0.00	0.00%
001.4041.5102.010	MEDICARE-NON UNION	1,171.37	1,367.00	781.64	1,348.00	1,438.00	90.00	6.68%
001.4041.5102.070	MEDICARE-TEMPORARY	844.73	1,088.00	951.04	1,088.00	1,088.00	0.00	0.00%
001.4041.5111.010	IPERS-NON UNION	8,194.61	8,898.00	5,444.68	8,778.00	9,362.00	584.00	6.65%
001.4041.5111.070	IPERS-PT TEMP	86.45	0.00	150.53	0.00	0.00	0.00	0.00%
001.4041.5121.010	GRP INSUR-NON UNION	18,342.08	22,163.00	12,004.36	22,997.00	25,488.00	2,491.00	10.83%
001.4041.5123.010	WORKCOMP-NON UNION	2,059.59	2,250.00	1,191.08	1,946.00	2,056.00	110.00	5.65%
001.4041.5123.070	WORKCOMP-TEMPORARY	1,889.74	2,054.00	1,549.72	1,777.00	1,777.00	0.00	0.00%
001.4041.5132.000	CLOTHING EXPENSE	0.00	300.00	268.50	300.00	300.00	0.00	0.00%
001.4041.5151.000	PHYSICALS/IMMUNIZATIONS	179.00	200.00	0.00	200.00	200.00	0.00	0.00%
001.4041.5210.000	ADVERTISING & LEGAL PUB	456.91	500.00	0.00	500.00	500.00	0.00	0.00%
001.4041.5216.000	BACKGROUND CHECKS	1,127.00	500.00	14.50	1,100.00	1,100.00	0.00	0.00%
001.4041.5280.000	DUES, MEMBER, SUBSCRIPTN	1,000.27	700.00	0.00	700.00	700.00	0.00	0.00%
001.4041.5331.000	PAYMENTS-OTHER ENTITIES	8,285.58	8,000.00	7,625.06	8,000.00	8,000.00	0.00	0.00%
001.4041.5342.000	CONTRACT-OUTSIDE HELP	571.54	600.00	525.18	600.00	600.00	0.00	0.00%
001.4041.5354.000	RECR SRV-UMPIRES	400.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.4041.5357.000	RECR SRV-ADMISSION	17,234.09	15,000.00	21,192.21	20,000.00	20,000.00	0.00	0.00%
001.4041.5358.000	RECR SRV-INSTRUCTR	300.00	2,000.00	2,800.00	3,000.00	3,000.00	0.00	0.00%
001.4041.5360.000	POSTAGE & SHIPPING	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.4041.5370.000	PRINTING & BINDING	0.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.4041.5380.000	RENTS & LEASES	150.00	2,500.00	0.00	2,500.00	2,500.00	0.00	0.00%
001.4041.5460.000	CONFERENCE EXPENSE	0.00	200.00	0.00	0.00	200.00	200.00	0.00%
001.4041.5465.000	TRAVEL - HOTEL/MOTEL	0.00	0.00	221.76	222.00	0.00	-222.00	-100.00%
001.4041.5600.000	OPERATING SUPPLIES	4,064.34	1,500.00	2,375.82	3,000.00	3,000.00	0.00	0.00%
001.4041.5601.000	PROMOTION/PROGRAM SPPLY	14,494.35	9,000.00	7,972.90	12,000.00	12,000.00	0.00	0.00%
001.4041.5613.000	MERCHANDISE FOR RESALE	5,500.87	5,000.00	1,078.65	5,000.00	5,000.00	0.00	0.00%
001.4041.5980.000	REFUNDS/REIMB	145.00	200.00	35.00	200.00	200.00	0.00	0.00%
001.4045.5030.070	PART-TIME TEMPORARY	109,831.76	110,000.00	129,224.46	162,167.00	162,167.00	0.00	0.00%

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001.4045.5050.060	PART-TIME REGULAR	12,946.01	14,747.00	9,108.65	14,747.00	15,258.00	511.00	3.47%
001.4045.5101.060	SOCIAL SECURITY-PT REGULAR	802.67	914.00	564.86	914.00	946.00	32.00	3.50%
001.4045.5101.070	SOCIAL SECURITY-PT TEMP	6,810.09	6,820.00	8,012.31	10,054.00	10,054.00	0.00	0.00%
001.4045.5102.060	MEDICARE-PT REGULAR	187.86	214.00	132.13	214.00	221.00	7.00	3.27%
001.4045.5102.070	MEDICARE-TEMPORARY	1,592.96	1,595.00	1,874.03	2,351.00	2,351.00	0.00	0.00%
001.4045.5111.060	IPERS-PT REGULAR	1,222.20	1,392.00	859.98	1,392.00	1,440.00	48.00	3.45%
001.4045.5123.060	WORKCOMP-PT REGULAR	354.58	350.00	215.80	321.00	332.00	11.00	3.43%
001.4045.5123.070	WORKCOMP-TEMPORARY	2,607.54	2,612.00	2,814.68	3,532.00	3,532.00	0.00	0.00%
001.4045.5132.000	CLOTHING EXPENSE	0.00	2,200.00	0.00	2,200.00	2,200.00	0.00	0.00%
001.4045.5210.000	ADVERTISING & LEGAL PUB	0.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.4045.5216.000	BACKGROUND CHECKS	500.00	600.00	0.00	600.00	600.00	0.00	0.00%
001.4045.5251.000	LICENSE & PERMITS	909.70	1,500.00	948.27	1,500.00	1,500.00	0.00	0.00%
001.4045.5280.000	DUES, MEMBER, SUBSCRIPTN	900.96	475.00	180.00	475.00	475.00	0.00	0.00%
001.4045.5290.000	INSURANCE - GENERAL	12,890.83	13,815.00	0.00	14,180.00	15,598.00	1,418.00	10.00%
001.4045.5300.000	INSURANCE - TORT LIAB	5,227.12	8,906.00	0.00	5,750.00	6,325.00	575.00	10.00%
001.4045.5331.000	PAYMENTS-OTHER ENTITIES	245.00	1,500.00	300.00	1,500.00	1,500.00	0.00	0.00%
001.4045.5342.000	CONTRACT-OUTSIDE HELP	1,729.43	3,000.00	5,186.97	5,000.00	5,800.00	800.00	16.00%
001.4045.5344.000	CONTRACT-MAINTENANCE	199.80	1,000.00	642.24	1,000.00	1,000.00	0.00	0.00%
001.4045.5380.000	RENTS & LEASES	0.00	600.00	73.52	600.00	600.00	0.00	0.00%
001.4045.5386.000	CONTRACT LAWN CARE	3,900.00	4,000.00	3,150.00	4,000.00	4,000.00	0.00	0.00%
001.4045.5410.000	REPAIRS & MAINTENANCE	852.98	5,000.00	3,769.10	5,000.00	5,000.00	0.00	0.00%
001.4045.5450.000	TELEPHONE/OTHR COMMNCTI	2,003.48	1,300.00	821.49	1,300.00	1,300.00	0.00	0.00%
001.4045.5460.000	CONFERENCE EXPENSE	0.00	250.00	350.00	250.00	250.00	0.00	0.00%
001.4045.5470.000	TRAINING	922.00	300.00	0.00	300.00	300.00	0.00	0.00%
001.4045.5481.000	ELECTRICITY	17,469.07	35,000.00	25,719.44	35,000.00	30,000.00	-5,000.00	-14.29%
001.4045.5482.000	NATURAL GAS	9,905.06	15,000.00	11,351.42	15,000.00	15,000.00	0.00	0.00%
001.4045.5600.000	OPERATING SUPPLIES	12,490.81	6,000.00	4,065.24	6,000.00	6,000.00	0.00	0.00%
001.4045.5605.000	OFFICE SUPPLIES	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.4045.5607.000	CHEMICAL SPPLY	23,897.58	12,000.00	15,995.21	20,000.00	24,000.00	4,000.00	20.00%
001.4045.5611.000	BLDG, GRD OPER/MAINT SPLY	1,817.24	3,000.00	1,601.08	3,000.00	3,000.00	0.00	0.00%
001.4045.5613.000	MERCHANDISE FOR RESALE	1,563.15	200.00	69.99	200.00	200.00	0.00	0.00%
001.4045.5718.000	MINOR EQUIP, UNCLASSIFIED	1,707.08	3,000.00	3,068.64	3,000.00	3,000.00	0.00	0.00%
001.4045.5980.000	REFUNDS/REIMB	45.00	150.00	46.73	150.00	150.00	0.00	0.00%
001.4045.5990.000	CASH SHORT & (OVER)	0.60	0.00	1.25	0.00	0.00	0.00	0.00%
001.4060.5331.000	PAYMENTS-OTHER ENTITIES	100,000.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.4065.5010.010	REGULAR-NON UNION	7,073.13	8,106.00	4,936.45	8,106.00	8,558.00	452.00	5.58%
001.4065.5030.070	PART-TIME TEMPORARY	0.00	4,000.00	0.00	4,000.00	4,000.00	0.00	0.00%
001.4065.5050.060	PART-TIME REGULAR	16,009.92	29,192.00	12,177.33	16,463.00	16,497.00	34.00	0.21%
001.4065.5101.010	SOCIAL SECURITY-NON UNION	438.57	503.00	302.52	503.00	531.00	28.00	5.57%

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001.4065.5101.060	SOCIAL SECURITY-PT REGULAR	992.60	1,810.00	754.92	1,021.00	1,023.00	2.00	0.20%
001.4065.5101.070	SOCIAL SECURITY-PT TEMP	0.00	2,108.00	0.00	248.00	248.00	0.00	0.00%
001.4065.5102.010	MEDICARE-NON UNION	102.51	118.00	70.70	118.00	124.00	6.00	5.08%
001.4065.5102.060	MEDICARE-PT REGULAR	232.02	423.00	176.47	239.00	239.00	0.00	0.00%
001.4065.5102.070	MEDICARE-TEMPORARY	0.00	493.00	0.00	58.00	58.00	0.00	0.00%
001.4065.5111.010	IPERS-NON UNION	667.68	765.00	465.99	765.00	808.00	43.00	5.62%
001.4065.5111.060	IPERS-PT REGULAR	1,511.23	2,756.00	1,149.48	1,554.00	1,557.00	3.00	0.19%
001.4065.5121.010	GRP INSUR-NON UNION	0.00	0.00	326.75	0.00	0.00	0.00	0.00%
001.4065.5123.010	WORKCOMP-NON UNION	167.86	192.00	107.51	177.00	186.00	9.00	5.08%
001.4065.5123.060	WORKCOMP-PT REGULAR	868.79	1,043.00	282.64	359.00	359.00	0.00	0.00%
001.4065.5123.070	WORKCOMP-TEMPORARY	0.00	931.00	0.00	95.00	95.00	0.00	0.00%
001.4065.5210.000	ADVERTISING & LEGAL PUB	0.00	1,000.00	0.00	0.00	1,000.00	1,000.00	0.00%
001.4065.5216.000	BACKGROUND CHECKS	0.00	200.00	0.00	200.00	200.00	0.00	0.00%
001.4065.5251.000	LICENSE & PERMITS	150.00	2,300.00	0.00	2,300.00	2,300.00	0.00	0.00%
001.4065.5290.000	INSURANCE - GENERAL	14,219.95	15,189.00	0.00	15,642.00	17,206.00	1,564.00	10.00%
001.4065.5300.000	INSURANCE - TORT LIAB	969.64	1,321.00	0.00	1,067.00	1,173.00	106.00	9.93%
001.4065.5342.000	CONTRACT-OUTSIDE HELP	860.28	1,200.00	2,525.88	3,000.00	0.00	-3,000.00	-100.00%
001.4065.5344.000	CONTRACT-MAINTENANCE	1,023.00	1,000.00	1,470.42	4,900.00	6,900.00	2,000.00	40.82%
001.4065.5380.000	RENTS & LEASES	0.00	300.00	0.00	300.00	300.00	0.00	0.00%
001.4065.5410.000	REPAIRS & MAINTENANCE	5,007.53	3,000.00	2,371.40	3,000.00	3,000.00	0.00	0.00%
001.4065.5411.000	RPR/MAINT - CIP	240.28	0.00	0.00	0.00	0.00	0.00	0.00%
001.4065.5450.000	TELEPHONE/OTHR COMMNCTI	2,084.74	2,000.00	1,440.35	2,000.00	2,000.00	0.00	0.00%
001.4065.5481.000	ELECTRICITY	38,797.74	50,000.00	36,631.85	45,000.00	45,000.00	0.00	0.00%
001.4065.5482.000	NATURAL GAS	4,582.04	8,000.00	3,395.12	6,000.00	6,000.00	0.00	0.00%
001.4065.5483.000	WATER	722.55	1,800.00	325.19	1,800.00	1,800.00	0.00	0.00%
001.4065.5488.000	SEWER	147.16	300.00	325.73	300.00	0.00	-300.00	-100.00%
001.4065.5489.000	SAFETY EQUIP/SUPPLIES	3,442.00	1,685.00	0.00	1,685.00	1,685.00	0.00	0.00%
001.4065.5600.000	OPERATING SUPPLIES	3,214.94	2,000.00	1,313.92	2,000.00	2,000.00	0.00	0.00%
001.4065.5611.000	BLDG,GRD OPER/MAINT SPLY	981.05	3,000.00	1,363.28	3,000.00	3,000.00	0.00	0.00%
001.4065.5613.000	MERCHANDISE FOR RESALE	694.20	0.00	0.00	0.00	0.00	0.00	0.00%
001.4065.5718.000	MINOR EQUIP, UNCLASSIFIED	288.93	1,800.00	0.00	1,800.00	1,800.00	0.00	0.00%
001.4065.5980.000	REFUNDS/REIMB	167.79	500.00	0.00	500.00	500.00	0.00	0.00%
001.4066.5030.070	PART-TIME TEMPORARY	2,640.01	1,500.00	4,171.71	1,500.00	5,000.00	3,500.00	233.33%
001.4066.5101.070	SOCIAL SECURITY-PT TEMP	163.71	93.00	258.65	93.00	310.00	217.00	233.33%
001.4066.5102.070	MEDICARE-TEMPORARY	38.28	22.00	60.47	22.00	73.00	51.00	231.82%
001.4066.5123.070	WORKCOMP-TEMPORARY	62.69	41.00	99.58	36.00	118.00	82.00	227.78%
001.4066.5251.000	LICENSE & PERMITS	1,665.63	0.00	0.00	0.00	0.00	0.00	0.00%
001.4066.5280.000	DUES, MEMBER, SUBSCRIPTN	50.00	0.00	110.00	0.00	0.00	0.00	0.00%
001.4066.5290.000	INSURANCE - GENERAL	1,200.00	1,006.00	0.00	1,320.00	1,452.00	132.00	10.00%

Budget Comparison Report

				Comparison 1		Comparison 1	
				Budget		to Parent	
				Parent Budget		Budget	%
				2024-2025	2025-2026	Increase /	
				FY25 Amendm...	FY26 Dept	(Decrease)	
Account Number		2023-2024	2024-2025	2024-2025			
		Total Activity	Total Budget	YTD Activity		Request	
				Through Jan			
001.4066.5300.000	INSURANCE - TORT LIAB	1,357.00	75.00	0.00	1,493.00	1,642.00	149.00
001.4066.5600.000	OPERATING SUPPLIES	1,422.50	500.00	472.78	500.00	500.00	0.00
001.4066.5608.000	RESALE SUPPLIES	395.10	0.00	3,106.75	0.00	0.00	0.00
001.4066.5611.000	BLDG.GRD OPER/MAINT SPLY	0.00	0.00	369.33	0.00	0.00	0.00
001.4066.5613.000	MERCHANDISE FOR RESALE	21,609.78	26,000.00	13,303.87	26,000.00	26,000.00	0.00
001.4066.5718.000	MINOR EQUIP, UNCLASSIFIED	0.00	1,000.00	0.00	1,000.00	1,000.00	0.00
001.5010.5010.010	REGULAR-NON UNION	5,863.47	6,207.00	2,026.46	4,945.00	6,553.00	1,608.00
001.5010.5060.010	TERM PAYOUTS-NON UNION	0.00	0.00	445.84	446.00	0.00	-446.00
001.5010.5101.010	SOCIAL SECURITY-NON UNION	353.20	385.00	154.81	307.00	406.00	99.00
001.5010.5102.010	MEDICARE-NON UNION	82.55	90.00	36.16	72.00	95.00	23.00
001.5010.5111.010	IPERS-NON UNION	553.41	586.00	191.24	467.00	619.00	152.00
001.5010.5121.010	GRP INSUR-NON UNION	981.19	1,186.00	-89.82	579.00	1,364.00	785.00
001.5010.5123.010	WORKCOMP-NON UNION	10.16	170.00	3.88	117.00	155.00	38.00
001.5010.5300.000	INSURANCE - TORT LIAB	98.02	119.00	0.00	108.00	119.00	11.00
001.5010.5342.000	CONTRACT-OUTSIDE HELP	90,087.00	254,800.00	1,600.00	4,800.00	4,800.00	0.00
001.5010.5410.000	REPAIRS & MAINTENANCE	9.50	4,000.00	89.09	4,000.00	4,000.00	0.00
001.5010.5562.000	GROUND'S EQUIP MAINT SPLY	0.00	4,000.00	0.00	4,000.00	4,000.00	0.00
001.5010.5600.000	OPERATING SUPPLIES	297.53	3,200.00	0.00	3,200.00	3,200.00	0.00
001.5010.5602.000	SUPPLIES - BANNERS	0.00	0.00	0.00	0.00	0.00	0.00
001.5020.5010.010	REGULAR-NON UNION	4,302.18	0.00	1,370.04	0.00	0.00	0.00
001.5020.5101.010	SOCIAL SECURITY-NON UNION	258.51	0.00	82.06	0.00	0.00	0.00
001.5020.5102.010	MEDICARE-NON UNION	60.47	0.00	19.18	0.00	0.00	0.00
001.5020.5111.010	IPERS-NON UNION	406.14	0.00	129.34	0.00	0.00	0.00
001.5020.5121.010	GRP INSUR-NON UNION	652.65	0.00	235.23	0.00	0.00	0.00
001.5020.5123.010	WORKCOMP-NON UNION	7.26	0.00	2.10	0.00	0.00	0.00
001.5020.5230.000	CONSULTING & PROF FEES	0.00	0.00	30,290.00	32,030.00	0.00	-32,030.00
001.5020.5234.000	LEGAL EXPENSES	33,837.00	0.00	14,582.00	20,000.00	20,000.00	0.00
001.5020.5300.000	INSURANCE - TORT LIAB	1,977.00	2,800.00	0.00	2,175.00	2,392.00	217.00
001.5020.5331.000	PAYMENTS-OTHER ENTITIES	50,000.00	150,000.00	75,000.00	150,000.00	160,000.00	10,000.00
001.5020.5410.000	REPAIRS & MAINTENANCE	142,780.56	50,000.00	45,376.00	75,000.00	75,000.00	0.00
001.5020.5440.000	TAXES PAID	0.00	0.00	1,350.00	2,700.00	2,700.00	0.00
001.5030.5230.000	CONSULTING & PROF FEES	0.00	0.00	8,640.00	6,900.00	0.00	-6,900.00
001.5030.5600.000	OPERATING SUPPLIES	75.90	0.00	0.00	0.00	0.00	0.00
001.5040.5010.010	REGULAR-NON UNION	40,174.76	120,333.00	7,462.16	33,735.00	108,535.00	74,800.00
001.5040.5020.010	OVERTIME	0.00	0.00	607.86	608.00	0.00	-608.00
001.5040.5060.010	TERM PAYOUTS-NON UNION	0.00	0.00	2,898.41	2,898.00	0.00	-2,898.00
001.5040.5101.010	SOCIAL SECURITY-NON UNION	2,489.34	7,461.00	660.30	2,092.00	6,729.00	4,637.00
001.5040.5102.010	MEDICARE-NON UNION	582.18	1,745.00	154.50	489.00	1,574.00	1,085.00
001.5040.5111.010	IPERS-NON UNION	3,771.21	11,359.00	679.02	3,185.00	10,246.00	7,061.00

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.5040.5121.010	GRP INSUR-NON UNION	0.00	15,334.00	1,013.39	9,430.00	27,460.00	18,030.00	191.20%
001.5040.5123.010	WORKCOMP-NON UNION	776.08	1,133.00	121.64	52.00	1,857.00	1,805.00	3,471.15%
001.5040.5210.000	ADVERTISING & LEGAL PUB	218.00	300.00	12,751.40	12,752.00	300.00	-12,452.00	-97.65%
001.5040.5230.000	CONSULTING & PROF FEES	1,771.00	2,000.00	49,546.50	42,000.00	2,000.00	-40,000.00	-95.24%
001.5040.5250.000	COURT, RECORD & FILING FEES	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.5040.5280.000	DUES, MEMBER, SUBSCRIPTN	13,896.50	17,500.00	0.00	14,000.00	14,000.00	0.00	0.00%
001.5040.5300.000	INSURANCE - TORT LIAB	888.04	1,331.00	0.00	977.00	1,075.00	98.00	10.03%
001.5040.5344.000	CONTRACT-MAINTENANCE	106.75	0.00	15.71	0.00	0.00	0.00	0.00%
001.5040.5347.000	CONTRACT-SOFTWARE MAINT	1,635.00	400.00	825.00	825.00	900.00	75.00	9.09%
001.5040.5360.000	POSTAGE & SHIPPING	170.00	200.00	0.00	200.00	200.00	0.00	0.00%
001.5040.5450.000	TELEPHONE/OTHR COMMNCTI	20.18	0.00	0.00	0.00	0.00	0.00	0.00%
001.5040.5460.000	CONFERENCE EXPENSE	351.32	800.00	0.00	800.00	800.00	0.00	0.00%
001.5040.5600.000	OPERATING SUPPLIES	64.50	200.00	48.15	200.00	200.00	0.00	0.00%
001.5040.5605.000	OFFICE SUPPLIES	58.66	100.00	29.39	100.00	100.00	0.00	0.00%
001.5040.5703.000	MINOR COMPUTER	0.00	0.00	234.37	0.00	0.00	0.00	0.00%
001.5900.5230.000	CONSULTIN & PROFESSIONAL	62,500.00	125,000.00	0.00	0.00	0.00	0.00	0.00%
001.5900.5331.000	PAYMENTS-OTHER ENTITIES	325,510.96	336,000.00	236,059.45	364,000.00	350,000.00	-14,000.00	-3.85%
001.6010.5030.070	PART-TIME TEMPORARY	11,000.00	11,000.00	6,768.00	11,000.00	11,000.00	0.00	0.00%
001.6010.5102.070	MEDICARE-TEMPORARY	159.59	160.00	98.19	160.00	160.00	0.00	0.00%
001.6010.5111.070	IPERS-PT TEMP	1,038.40	1,038.00	638.90	1,038.00	1,038.00	0.00	0.00%
001.6010.5123.070	WORKCOMP-TEMPORARY	18.94	19.00	10.55	17.00	17.00	0.00	0.00%
001.6010.5280.000	DUES, MEMBER, SUBSCRIPTN	30.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.6010.5300.000	INSURANCE - TORT LIAB	140.04	198.00	0.00	154.00	169.00	15.00	9.74%
001.6010.5450.000	TELEPHONE/OTHR COMMNCTI	520.92	400.00	175.76	400.00	400.00	0.00	0.00%
001.6010.5460.000	CONFERENCE EXPENSE	0.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.6010.5600.000	OPERATING SUPPLIES	105.97	250.00	19.15	250.00	250.00	0.00	0.00%
001.6010.5605.000	OFFICE SUPPLIES	58.65	0.00	0.00	0.00	0.00	0.00	0.00%
001.6011.5030.070	PART-TIME TEMPORARY	35,914.56	38,500.00	23,284.80	38,500.00	38,500.00	0.00	0.00%
001.6011.5101.070	SOCIAL SECURITY-PT TEMP	771.35	1,044.00	209.99	1,044.00	1,044.00	0.00	0.00%
001.6011.5102.070	MEDICARE-TEMPORARY	520.37	558.00	337.38	558.00	558.00	0.00	0.00%
001.6011.5111.070	IPERS-PT TEMP	2,215.81	2,077.00	1,878.51	2,077.00	2,077.00	0.00	0.00%
001.6011.5123.070	WORKCOMP-TEMPORARY	62.63	65.00	36.36	60.00	60.00	0.00	0.00%
001.6011.5230.000	CONSULTING & PROF FEES	0.00	2,350.00	1,320.00	1,320.00	2,350.00	1,030.00	78.03%
001.6011.5300.000	INSURANCE - TORT LIAB	784.28	1,141.00	0.00	863.00	949.00	86.00	9.97%
001.6011.5331.000	PAYMENTS - OTHER ENTITIES	0.00	250.00	0.00	0.00	0.00	0.00	0.00%
001.6011.5460.000	CONFERENCE EXPENSE	492.90	1,750.00	80.00	1,750.00	1,750.00	0.00	0.00%
001.6011.5600.000	OPERATING SUPPLIES	208.61	200.00	40.27	200.00	200.00	0.00	0.00%
001.6011.5702.000	MINOR OFFICE FURN/EQUIP	0.00	0.00	2,569.70	2,570.00	0.00	-2,570.00	-100.00%
001.6012.5010.010	REGULAR-NON UNION	69,641.40	139,599.00	60,750.02	123,750.00	154,288.00	30,538.00	24.68%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.6012.5057.010	CAR REIMB-NON UNION	1,350.05	2,700.00	1,523.15	3,600.00	3,600.00	0.00	0.00%
001.6012.5060.010	TERM PAYOUTS-NON UNION	65,318.40	0.00	0.00	0.00	0.00	0.00	0.00%
001.6012.5101.010	SOCIAL SECURITY-NON UNION	7,364.79	8,007.00	4,111.04	7,080.00	8,063.00	983.00	13.88%
001.6012.5102.010	MEDICARE-NON UNION	2,053.97	2,063.00	961.54	1,847.00	2,289.00	442.00	23.93%
001.6012.5111.010	IPERS-NON UNION	6,397.30	13,433.00	5,734.86	12,022.00	14,905.00	2,883.00	23.98%
001.6012.5112.010	ICMA-NON UNION	0.00	0.00	2,205.04	3,713.00	4,629.00	916.00	24.67%
001.6012.5121.010	GRP INSUR-NON UNION	5,371.11	7,523.00	7,852.96	17,382.00	20,454.00	3,072.00	17.67%
001.6012.5123.010	WORKCOMP-NON UNION	230.23	236.00	96.47	192.00	239.00	47.00	24.48%
001.6012.5192.000	UNEMPLOYMENT-NON UNION	0.00	0.00	353.60	0.00	0.00	0.00	0.00%
001.6012.5230.000	CONSULTING & PROF FEES	36,412.50	500.00	42,796.00	50,000.00	10,000.00	-40,000.00	-80.00%
001.6012.5280.000	DUES, MEMBER, SUBSCRIPTN	1,614.00	1,750.00	600.00	1,750.00	1,750.00	0.00	0.00%
001.6012.5300.000	INSURANCE - TORT LIAB	909.03	1,104.00	0.00	1,000.00	1,100.00	100.00	10.00%
001.6012.5342.000	CONTRACT-OUTSIDE HELP	10.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6012.5450.000	TELEPHONE/OTHR COMMNCTI	1,000.92	900.00	655.76	1,000.00	1,000.00	0.00	0.00%
001.6012.5460.000	CONFERENCE EXPENSE	330.00	1,000.00	1,627.95	2,000.00	2,000.00	0.00	0.00%
001.6012.5461.000	TRAVEL-AIRFARE	388.40	0.00	100.00	500.00	500.00	0.00	0.00%
001.6012.5462.000	TRAVEL-OTHER	4.74	0.00	0.00	0.00	0.00	0.00	0.00%
001.6012.5463.000	TRAVEL-MOVING REIMBSMT	8,316.00	0.00	6,949.50	7,000.00	0.00	-7,000.00	-100.00%
001.6012.5464.000	TRAVEL-PER DIEM	0.00	0.00	300.02	0.00	500.00	500.00	0.00%
001.6012.5465.000	TRAVEL - HOTEL/MOTEL	1,491.12	1,000.00	1,554.65	1,500.00	1,500.00	0.00	0.00%
001.6012.5472.000	MILEAGE REIBURSE	0.00	0.00	134.00	200.00	0.00	-200.00	-100.00%
001.6012.5475.000	RECRUITING EXPENSES	611.48	0.00	0.00	0.00	0.00	0.00	0.00%
001.6012.5600.000	OPERATING SUPPLIES	188.30	250.00	69.52	250.00	500.00	250.00	100.00%
001.6012.5605.000	OFFICE SUPPLIES	52.42	250.00	86.54	250.00	500.00	250.00	100.00%
001.6012.5702.000	MINOR OFFICE FURN/EQUIP	0.00	0.00	1,527.00	2,500.00	1,200.00	-1,300.00	-52.00%
001.6012.5703.000	MINOR COMPUTER	328.00	0.00	774.00	774.00	300.00	-474.00	-61.24%
001.6020.5010.010	REGULAR-NON UNION	82,789.62	93,407.00	57,048.03	93,407.00	98,509.00	5,102.00	5.46%
001.6020.5101.010	SOCIAL SECURITY-NON UNION	4,760.81	5,791.00	3,323.16	5,791.00	6,108.00	317.00	5.47%
001.6020.5102.010	MEDICARE-NON UNION	1,113.44	1,354.00	777.21	1,354.00	1,428.00	74.00	5.47%
001.6020.5111.010	IPERS-NON UNION	7,815.35	8,818.00	5,385.38	8,818.00	9,299.00	481.00	5.45%
001.6020.5121.010	GRP INSUR-NON UNION	19,625.84	23,714.00	12,845.26	23,175.00	27,271.00	4,096.00	17.67%
001.6020.5122.000	RETIRES GRP HLTH INS	9,766.03	8,949.00	6,391.96	8,949.00	8,949.00	0.00	0.00%
001.6020.5123.010	WORKCOMP-NON UNION	143.79	158.00	88.32	145.00	153.00	8.00	5.52%
001.6020.5210.000	ADVERTISING & LEGAL PUB	9,880.93	10,750.00	6,822.70	10,750.00	10,750.00	0.00	0.00%
001.6020.5230.000	CONSULTING & PROF FEES	4,304.26	5,000.00	3,720.77	5,000.00	0.00	-5,000.00	-100.00%
001.6020.5250.000	COURT, RECORD & FILING FEES	1,279.76	1,500.00	861.22	1,500.00	1,500.00	0.00	0.00%
001.6020.5280.000	DUES, MEMBER, SUBSCRIPTN	11,332.00	13,000.00	11,476.16	13,000.00	13,000.00	0.00	0.00%
001.6020.5300.000	INSURANCE - TORT LIAB	716.04	871.00	0.00	788.00	866.00	78.00	9.90%
001.6020.5344.000	CONTRACT-MAINTENANCE	727.07	1,000.00	333.99	1,000.00	1,000.00	0.00	0.00%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.6020.5347.000	CONTRACT-SOFTWARE MAINT	500.00	450.00	0.00	500.00	11,535.00	11,035.00	2,207.00%
001.6020.5360.000	POSTAGE & SHIPPING	30.58	1,500.00	732.55	1,500.00	1,500.00	0.00	0.00%
001.6020.5410.000	REPAIRS & MAINTENANCE	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.6020.5450.000	TELEPHONE/OTHR COMMNCTI	520.92	600.00	175.76	600.00	600.00	0.00	0.00%
001.6020.5460.000	CONFERENCE EXPENSE	0.00	500.00	0.00	500.00	500.00	0.00	0.00%
001.6020.5464.000	TRAVEL-PER DIEM	0.00	40.00	0.00	60.00	40.00	-20.00	-33.33%
001.6020.5472.000	MILEAGE REIMBURSE	79.20	150.00	212.50	504.00	150.00	-354.00	-70.24%
001.6020.5600.000	OPERATING SUPPLIES	3.79	0.00	0.00	0.00	0.00	0.00	0.00%
001.6020.5605.000	OFFICE SUPPLIES	804.35	800.00	150.10	800.00	800.00	0.00	0.00%
001.6020.5980.000	REFUNDS/REIMB	609.38	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5010.010	REGULAR-NON UNION	337,159.53	390,062.00	234,798.72	390,062.00	411,825.00	21,763.00	5.58%
001.6021.5020.010	OVERTIME-NON UNION	90.90	3,000.00	0.00	3,000.00	3,000.00	0.00	0.00%
001.6021.5060.010	TERM PAYOUTS-NON UNION	3,784.40	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5101.010	SOCIAL SECURITY-NON UNION	19,648.74	24,184.00	13,642.82	24,184.00	25,719.00	1,535.00	6.35%
001.6021.5102.010	MEDICARE-NON UNION	4,595.12	5,656.00	3,190.64	5,656.00	6,015.00	359.00	6.35%
001.6021.5111.010	IPERS-NON UNION	31,836.21	36,822.00	22,164.88	36,822.00	39,159.00	2,337.00	6.35%
001.6021.5121.010	GRP INSUR-NON UNION	85,087.55	104,887.00	55,994.29	102,504.00	120,621.00	18,117.00	17.67%
001.6021.5123.010	WORKCOMP-NON UNION	592.28	659.00	363.76	604.00	643.00	39.00	6.46%
001.6021.5151.000	PHYSICALS/IMMUNIZATIONS	179.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5192.010	UNEMPLOYMENT-NON UNION	6,061.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5210.000	ADVERTISING & LEGAL PUB	92.66	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5215.000	BANK CHARGES	2,227.15	2,000.00	2,394.80	2,500.00	2,500.00	0.00	0.00%
001.6021.5216.000	BACKGROUND CHECKS	42.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5230.000	CONSULTING & PROF FEES	2,675.00	9,350.00	8,540.00	13,000.00	9,500.00	-3,500.00	-26.92%
001.6021.5231.000	ACCOUNTING FEES	630.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5232.000	AUDITING FEES	21,878.00	43,375.00	18,100.00	71,375.00	58,000.00	-13,375.00	-18.74%
001.6021.5280.000	DUES, MEMBER, SUBSCRIPTN	1,075.00	1,200.00	229.51	1,200.00	1,200.00	0.00	0.00%
001.6021.5300.000	INSURANCE - TORT LIAB	2,960.19	4,021.00	0.00	3,256.00	3,582.00	326.00	10.01%
001.6021.5344.000	CONTRACT-MAINTENANCE	457.71	520.00	277.60	520.00	520.00	0.00	0.00%
001.6021.5347.000	CONTRACT-SOFTWARE MAINT	47,702.94	52,000.00	50,705.71	52,500.00	55,125.00	2,625.00	5.00%
001.6021.5360.000	POSTAGE & SHIPPING	3,640.28	3,500.00	2,754.09	5,000.00	5,100.00	100.00	2.00%
001.6021.5410.000	REPAIRS & MAINTENANCE	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.6021.5450.000	TELEPHONE/OTHR COMMNCTI	2,063.73	1,600.00	85.52	900.00	1,200.00	300.00	33.33%
001.6021.5460.000	CONFERENCE EXPENSE	50.00	500.00	605.00	1,200.00	1,200.00	0.00	0.00%
001.6021.5470.000	TRAINING	470.00	200.00	0.00	200.00	200.00	0.00	0.00%
001.6021.5570.000	VEHICLE GAS	0.00	0.00	11.58	0.00	0.00	0.00	0.00%
001.6021.5600.000	OPERATING SUPPLIES	323.06	100.00	350.71	250.00	250.00	0.00	0.00%
001.6021.5605.000	OFFICE SUPPLIES	1,253.91	2,000.00	1,460.65	1,600.00	1,600.00	0.00	0.00%
001.6021.5612.000	COMPUTER COMPONENTS	10.14	500.00	132.00	500.00	500.00	0.00	0.00%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.6021.5702.000	MINOR OFFICE FURN/EQUIP	149.99	100.00	713.89	715.00	100.00	-615.00	-86.01%
001.6021.5703.000	MINOR COMPUTER	0.00	200.00	87.10	200.00	200.00	0.00	0.00%
001.6021.5704.000	MINOR SOFTWARE <\$5,000	0.00	20.00	0.00	20.00	20.00	0.00	0.00%
001.6021.5718.000	MINOR EQUIP, UNCLASSIFIED	0.00	100.00	0.00	100.00	100.00	0.00	0.00%
001.6021.5870.000	FINES & SERVICE CHRGS	0.00	25.00	3.11	25.00	25.00	0.00	0.00%
001.6021.5980.000	REFUNDS/REIMBURSEMENTS	50.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6021.5990.000	CASH SHORT & (OVER)	9.20	10.00	-2.20	10.00	10.00	0.00	0.00%
001.6025.5010.010	REGULAR-NON UNION	96,534.68	105,040.00	64,229.61	105,040.00	110,895.00	5,855.00	5.57%
001.6025.5101.010	SOCIAL SECURITY-NON UNION	5,690.85	6,512.00	3,796.16	6,512.00	6,875.00	363.00	5.57%
001.6025.5102.010	MEDICARE-NON UNION	1,330.98	1,523.00	887.85	1,523.00	1,608.00	85.00	5.58%
001.6025.5111.010	IPERS-NON UNION	9,112.95	9,916.00	6,063.25	9,916.00	10,468.00	552.00	5.57%
001.6025.5121.010	GRP INSUR-NON UNION	16,878.17	20,394.00	11,046.91	19,931.00	23,453.00	3,522.00	17.67%
001.6025.5123.010	WORKCOMP-NON UNION	167.46	177.00	99.43	163.00	172.00	9.00	5.52%
001.6025.5280.000	DUES, MEMBER, SUBSCRIPTN	934.00	1,000.00	29.00	1,000.00	1,000.00	0.00	0.00%
001.6025.5300.000	INSURANCE - TORT LIAB	608.28	819.00	0.00	669.00	736.00	67.00	10.01%
001.6025.5342.000	CONTRACT-OUTSIDE HELP	0.00	1,000.00	0.00	1,000.00	1,000.00	0.00	0.00%
001.6025.5360.000	POSTAGE & SHIPPING	68.00	0.00	0.00	68.00	68.00	0.00	0.00%
001.6025.5450.000	TELEPHONE/OTHR COMMNCTI	520.92	500.00	175.76	500.00	500.00	0.00	0.00%
001.6025.5460.000	CONFERENCE EXPENSE	1,515.16	2,000.00	490.75	2,000.00	2,000.00	0.00	0.00%
001.6025.5600.000	OPERATING SUPPLIES	84.94	100.00	28.32	100.00	100.00	0.00	0.00%
001.6025.5605.000	OFFICE SUPPLIES	1,849.82	2,000.00	231.57	2,000.00	2,000.00	0.00	0.00%
001.6030.4875.000	REFUNDS	0.00	0.00	-5.21	-5.00	0.00	5.00	-100.00%
001.6030.5210.000	ADVERTISING & LEGAL PUB	500.00	0.00	0.00	0.00	0.00	0.00	0.00%
001.6030.5365.000	ELECTION EXPENSE	19,115.77	20,000.00	11,102.61	11,103.00	20,000.00	8,897.00	80.13%
001.6030.5370.000	PRINTING & BINDING	8,058.35	0.00	0.00	0.00	0.00	0.00	0.00%
001.6040.5230.000	CONSULTING & PROF FEES	0.00	5,000.00	0.00	5,000.00	5,000.00	0.00	0.00%
001.6040.5234.000	LEGAL EXPENSES	62,064.42	50,000.00	24,177.51	75,000.00	75,000.00	0.00	0.00%
001.6040.5235.000	UNION NEGOTIATING FEES	9,572.50	0.00	0.00	0.00	0.00	0.00	0.00%
001.6040.5236.000	LEGAL-PERSONNEL	1,359.00	4,000.00	1,801.50	4,000.00	4,000.00	0.00	0.00%
001.6040.5250.000	COURT, RECORD & FILING FEES	0.00	250.00	0.00	250.00	250.00	0.00	0.00%
001.6040.5300.000	INSURANCE - TORT LIAB	291.00	546.00	0.00	320.00	352.00	32.00	10.00%
001.6040.5331.000	PAYMENTS-OTHER ENTITIES	10,000.00	10,000.00	7,500.00	10,000.00	10,000.00	0.00	0.00%
001.6040.5342.000	CONTRACT-OUTSIDE HELP	1.11	0.00	0.00	0.00	0.00	0.00	0.00%
001.6040.5472.000	MILEAGE REIMBUSMENT	0.00	500.00	0.00	0.00	0.00	0.00	0.00%
001.6050.5010.010	REGULAR-NON UNION	83,894.59	94,055.00	57,521.58	94,055.00	99,298.00	5,243.00	5.57%
001.6050.5010.040	REGULAR-PPME UNION	23,827.14	45,445.00	27,645.78	47,286.00	49,153.00	1,867.00	3.95%
001.6050.5020.040	OVERTIME-PPME UNION	35.89	0.00	566.84	500.00	0.00	-500.00	-100.00%
001.6050.5101.010	SOCIAL SECURITY-NON UNION	5,208.15	5,831.00	3,565.25	5,831.00	6,156.00	325.00	5.57%
001.6050.5101.040	SOCIAL SECURITY-PPME UNION	1,339.31	2,818.00	1,630.84	2,932.00	3,048.00	116.00	3.96%

Budget Comparison Report

Account Number		2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
					2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001.6050.5102.010	MEDICARE-NON UNION	1,217.99	1,364.00	833.64	1,364.00	1,440.00	76.00	5.57%
001.6050.5102.040	MEDICARE-PPME UNION	313.08	659.00	381.47	686.00	713.00	27.00	3.94%
001.6050.5111.010	IPERS-NON UNION	7,919.75	8,879.00	5,430.18	8,879.00	9,374.00	495.00	5.57%
001.6050.5111.040	IPERS-PPME UNION	2,252.45	4,290.00	2,663.40	4,464.00	4,640.00	176.00	3.94%
001.6050.5121.010	GRP INSUR-NON UNION	0.00	0.00	980.23	0.00	0.00	0.00	0.00%
001.6050.5121.040	GRP INSUR-PPME UNION	6,672.98	16,126.00	7,328.77	13,486.00	18,545.00	5,059.00	37.51%
001.6050.5123.010	WORKCOMP-NON UNION	3,067.13	3,996.00	1,840.47	3,008.00	3,176.00	168.00	5.59%
001.6050.5123.040	WORKCOMP-PPME UNION	1,086.18	2,228.00	1,009.45	1,681.00	1,747.00	66.00	3.93%
001.6050.5151.000	PHYSICALS/IMMUNIZATIONS	0.00	0.00	31.12	32.00	0.00	-32.00	-100.00%
001.6050.5251.000	LICENSE & PERMITS	75.00	300.00	0.00	75.00	75.00	0.00	0.00%
001.6050.5290.000	INSURANCE - GENERAL	18,403.82	19,626.00	0.00	20,244.00	22,269.00	2,025.00	10.00%
001.6050.5300.000	INSURANCE - TORT LIAB	621.02	299.00	0.00	683.00	751.00	68.00	9.96%
001.6050.5342.000	CONTRACT-OUTSIDE HELP	3,456.43	3,300.00	3,707.43	3,300.00	3,300.00	0.00	0.00%
001.6050.5344.000	CONTRACT-MAINTENANCE	6,852.74	10,500.00	6,417.14	10,500.00	10,500.00	0.00	0.00%
001.6050.5410.000	REPAIRS & MAINTENANCE	5,659.22	10,000.00	5,012.77	10,000.00	10,000.00	0.00	0.00%
001.6050.5450.000	TELEPHONE/OTHR COMMNCTI	4,006.36	4,830.00	1,014.98	4,830.00	4,830.00	0.00	0.00%
001.6050.5481.000	ELECTRICITY	1,391.67	3,000.00	1,351.13	2,750.00	3,000.00	250.00	9.09%
001.6050.5482.000	NATURAL GAS	4,966.39	9,135.00	1,053.30	9,135.00	9,320.00	185.00	2.03%
001.6050.5565.000	VEHICLE OPER/MAINT SPPLY	0.00	0.00	55.90	250.00	0.00	-250.00	-100.00%
001.6050.5570.000	VEHICLE GAS	2,127.26	3,600.00	964.87	3,600.00	3,600.00	0.00	0.00%
001.6050.5600.000	OPERATING SUPPLIES	2,288.61	5,000.00	1,035.42	3,500.00	3,500.00	0.00	0.00%
001.6050.5605.000	OFFICE SUPPLIES	54.00	800.00	13.94	500.00	500.00	0.00	0.00%
001.6050.5611.000	BLDG,GRD OPER/MAINT SPLY	482.54	5,000.00	1,364.35	3,425.00	3,500.00	75.00	2.19%
001.6050.5704.000	MINOR SOFTWARE	228.00	150.00	0.00	240.00	240.00	0.00	0.00%
001.6050.5718.000	MINOR EQUIP, UNCLASSIFIED	689.92	2,000.00	801.09	2,000.00	2,000.00	0.00	0.00%
001.6050.5776.000	BUILDINGS & IMPROVEMENTS	0.00	0.00	74.62	75.00	0.00	-75.00	-100.00%
001.6051.5251.000	LICENSE & PERMITS	75.00	75.00	0.00	75.00	75.00	0.00	0.00%
001.6051.5290.000	INSURANCE - GENERAL	5,277.75	5,705.00	0.00	5,806.00	6,386.00	580.00	9.99%
001.6051.5300.000	INSURANCE - TORT LIAB	139.00	170.00	0.00	153.00	168.00	15.00	9.80%
001.6051.5342.000	CONTRACT-OUTSIDE HELP	512.07	1,340.00	819.17	1,340.00	1,340.00	0.00	0.00%
001.6051.5344.000	CONTRACT-MAINTENANCE	5,392.58	6,500.00	4,738.10	6,500.00	6,560.00	60.00	0.92%
001.6051.5410.000	REPAIRS & MAINTENANCE	2,582.09	6,000.00	1,136.78	6,000.00	6,000.00	0.00	0.00%
001.6051.5481.000	ELECTRICITY	10,519.94	16,802.00	9,202.87	15,410.00	16,802.00	1,392.00	9.03%
001.6051.5482.000	NATURAL GAS	4,118.52	6,090.00	1,793.64	5,970.00	6,090.00	120.00	2.01%
001.6051.5600.000	OPERATING SUPPLIES	1,407.82	2,700.00	477.38	2,700.00	2,700.00	0.00	0.00%
001.6051.5611.000	BLDG,GRD OPER/MAINT SPLY	414.58	1,000.00	121.63	1,000.00	1,000.00	0.00	0.00%
001.6051.5718.000	MINOR EQUIP, UNCLASSIFIED	0.00	800.00	324.00	800.00	800.00	0.00	0.00%
001.6070.5300.000	INSURANCE - TORT LIAB	361.00	355.00	0.00	397.00	437.00	40.00	10.08%
001.6070.5342.000	CONTRACT-OUTSIDE HELP	4,185.00	2,000.00	647.50	2,000.00	2,000.00	0.00	0.00%

Budget Comparison Report

					Comparison 1	Comparison 1		
					Budget	to Parent		
					Budget	Budget		
						Increase /		
						(Decrease)		

Fund	2023-2024 Total Activity	2024-2025 Total Budget	2024-2025 YTD Activity Through Jan	Parent Budget	Comparison 1 Budget	Comparison 1 to Parent Budget	%
				2024-2025 FY25 Amendm...	2025-2026 FY26 Dept Request	Increase / (Decrease)	
001 - GENERAL FUND	119,242.49	0.00	-996,709.62	0.00	0.00	0.00	0.00%
Report Total:	119,242.49	0.00	-996,709.62	0.00	0.00	0.00	0.00%

Local Option Sales Tax (L.O.S.T) Balances 2/17/2025		LOST- Prop. Tax Relief	LOST- Council Designated	LOST- Capital Projects	TOTAL FUND 121
1	Fund balance 6/30/2024	1,417,958	3,541,521	570,192	5,529,670
2					
3	Budgeted L.O.S.T. Revenues (78% Relief, 22% Council) adopted budget \$4M, amended \$4.2M	3,276,000	924,000	-	4,200,000
4	Interest on Investments	45,000	150,000	15,000	210,000
5	Credit card rebate		23		23
6	Sub-Total Revenues	3,321,000	1,074,023	15,000	4,410,023
7					
8	Buy down property tax levy-current revenues (Trsf to fund 200 Debt) original adopted	(3,120,000)			(3,120,000)
9	Buy down property tax levy-fund bal	(1,000,000)			(1,000,000)
10	Res 2024-101 Reserve for General Insurance Reserve Fund (transfer to 011)	(100,000)			(100,000)
11	Cash Flow reserve 17%.		(249,050)		(249,050)
12	Res 2022-341 Downtown Site Furnishings for Main St & Vets Courtyard FY23 \$74,510.48:\$160K; Contractor will invoice us so transfer to fund 364 where costs will be expensed (E Main Center to 3rd Ave & Center Church to State proj STR22002		(85,490)		(85,490)
13	New Home Buyer Incentive (100 homes @ \$2500/each) Only 3 in FY23; 4 in FY24; Est 10 total for FY25		(25,000)		(25,000)
14	Fireworks		(5,000)		(5,000)
15	Transfer to General Fund 001 (removed MACC and band, updated rev related to levies originally 684,447)		(567,884)		(567,884)
16	Res 2024-050 CO2 Systems Development \$20K (48 new jobs); changed to fund 160 instead		-		-
17	Res 2024-025 2/5/2024 CA Recruitment		(16,379)		(16,379)
18	River's Edge Trail bridges 2-5; Council Res 2024-114 change to Fed Active Transp Infrast Invest Prog if awarded bike path Mtown		(250,000)		(250,000)
19	Res 2022-217 Purchase of Coliseum Veterans Gallery cabinets FY23 \$19,073\$43K		(23,927)		(23,927)
20	Res 2022-290 Riverside Cemetery Well Reimbursement; changed purpose on Res 2024-271 to on demand pump system		(45,000)		(45,000)
21	Res 2022-236 Region 6 Housing Trust Fund (Local Match)		(37,581)		(37,581)
22	Res 2024-150 PD vehicle/body cameras over 5 years with Axon (1st year funded with LOST)		(100,000)		(100,000)
23	Transfer to 340 - Bike Trail Engineering & Design TRL18002 FY19 \$8401.50+FY23 \$36349+FY24 5374: \$65,000		(14,876)		(14,876)
24	Res 2023-190 purchase ROW 901 N. 3rd Ave (\$230+100+170)		(500)		(500)
25	To 132:Res 2023-086&2020-281 City/Owner Contribution for DTR Project 21 and 23 W.Main 200K-32908.71 in FY22 +500K-262,192.46FY24-\$197,341.65 FY25 transfer (\$207,557remainder not needed since Pentz Appliance didn't do project)		(197,342)		(197,342)
26					
	Res 2024-043 Repair of City Hall & Carnegie masonry FY24 pd \$9033:15000; FY25 paid \$2825 PROJECT DONE		(2,825)		(2,825)
27	Res 2022-038 National Community Survey and National Employee Survey \$6,000:\$20,495 (reimplemented)+1600 inflation		(7,600)		(7,600)
28	Res 2024-279 Civic Plus Improvements (Clerk, Meeting Manager, Municode)		(12,750)		(12,750)
29	Res 2024-365 Arts & Culture Alliance \$125K Placemaking +\$5K band= \$130,000 for 5 years (2 qtrs in FY25)		(65,000)		(65,000)
30	Res 2025-003 Solid Waste Study by IA State		(9,004)		(9,004)
31	Total Budgeted Expenses	(4,220,000)	(1,715,207)	-	(5,935,207)
32					
33	Projected Fund balance 6/30/2025	518,958	2,900,337	585,192	4,004,486
34					
35	Budgeted L.O.S.T. Revenues (CHANGE 75% Relief, 25% Council)	3,150,000	1,050,000	-	4,200,000
36	Interest on Investments	15,580	82,110	5,000	102,690
37	Sub-Total Revenues	3,165,580	1,132,110	5,000	4,302,690
38					
39	Buy down property tax levy-current revenues (Trsf to fund 200 Debt)	(3,150,000)			(3,150,000)
40	Buy down property tax levy-fund bal	(200,000)			(200,000)
41	Cash Flow reserve 18% of GF exp before transfers (to get to 18%, an add'l \$177,353)		(205,192)		(205,192)
42	Fireworks		(5,000)		(5,000)
43	Transfer to General Fund 001		(1,076,145)		(1,076,145)
44	Res 2023-072 10% LEAD grant match Est \$100,000 over 4 years (may not need)		(100,000)		(100,000)
45	Res 2024-101 Reserve for General Insurance Reserve Fund (transfer to 011) Note: \$100K FY24-26	(100,000)			(100,000)
46	Res 2024-365 Arts & Culture Alliance \$125K+\$5K band= \$130,000 for 5 years		(130,000)		(130,000)
47	Transf to 364: Street improvements budgeted in CIP (Center St Median, 18th Ave patch)			(115,250)	(115,250)
48	Res 2022-354 Use Fund 360 bond up so now STREET IMPROVEMENTS \$343,276. Trs to 363 E. Main St			(128,026)	(128,026)
49	Res 2022-354 Use Fund 360 bond up so now STREET IMPROVEMENTS \$343,276. Trs to 364 Lincoln Way			(100,000)	(100,000)
50	Transfer to Fund 311: Edgewood Extension (incl \$108,854.16 N. 5th Ave land purchase). \$129,880.78 Trans in FY23; \$756,751.15 in FY24			(120,547)	(120,547)
51	New Home Buyer Incentive (100 homes @ \$2500/each) Only 3 in FY23; 4 in FY24; Est 10 total for FY25, bal in FY26		(207,500)		(207,500)
52	Transfer to Fund 031 building maintenance fund so funded thru 6/30/26		(86,528)		(86,528)
53	Sidewalk Improvement citizen reimbursement (Res.2020-076)		(50,000)		(50,000)
54					-
55	Total Budgeted Expenses	(3,450,000)	(1,860,365)	(463,823)	(5,774,188)
56					
57	Projected Fund balance 6/30/2026 before transfer to General Fund	234,538	2,172,082	126,368	2,532,988
58					
59	Future years:				
60	Res 2024-101 Reserve for General Insurance Reserve Fund (transfer to 011) Note: \$100K FY24-26	(100,000)			(100,000)
61	Res 2024- YSS IMPACT use all of ARPA funds first and if need to continue until 12/31/26		(50,000)		(50,000)
62	Res 2024-265 Arts & Culture Alliance \$125K Placemaking +\$5K band= \$130,000 for 5 years (2 qtrs in FY29)		(585,000)		(585,000)