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
OCTOBER 28, 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

F. CONSENT AGENDA

1. APPROVE MINUTES 10/14/24 MEETING AND BILL LIST $1,647,137.40

Documents:

2024-10-14_SIGNED Council Minutes.pdf
2024-10-28_BILL LIST_Summary.pdf
2024-10-28_BILL LIST_Detail.pdf

2. APPROVE CIVIL SERVICE NEW HIRE LISTS - POLICE

CHIEF, POLICE OFFICER, STREET MECHANIC

Documents:

2024-10-28_CONSENT_Police Chief New Hire List.pdf
2024-10-28_CONSENT_Police Officer New Hire List.pdf
2024-10-28_CONSENT_Street Mechanic New Hire List.pdf

3. **APPROVE ALCOHOL LICENSE RENEWALS**

   - Oliver Beene Designs, 214 E Main Street
   - Eastside Liquor and Grocery, 1116 E Nevada Street

4. **APPROVE IOWA RETAIL PERMIT APPLICATION FOR CIGARETTE/TOBACCO/NICOTINE/VAPOR**

   Change in ownership legal name - Panhandle Stores 786 LLC, dba Lounge on Main (previously Marshall Tobacco & Vape Outlet), 19 W Main St

5. **RESOLUTION 2024-225 APPROVING CITY FEE SCHEDULE**

   Documents:

   2024-10-28_2024-225_Resolution Approving City Fee Schedule.pdf
   2024-10-28_2024-225_Memo Master Fee Schedule Revision.pdf
   2024-10-28_2024-225_MASTER Fee Schedule.pdf

6. **RESOLUTION 2024-226 TO NAME DEPOSITORIES, ESTABLISH MAXIMUM DEPOSIT AMOUNTS, AND IDENTIFY POSITIONS AUTHORIZED TO CONDUCT BUSINESS ON BEHALF OF THE CITY OF MARSHALLTOWN**

   Documents:

   2024-10-28_2024-226_Resolution to Name Depositories, Establish Maximum Deposit Amounts.pdf
   2024-10-28_2024-226_Memo to change Home Federal to Alerus Financial on Depository.pdf

7. **RESOLUTION 2024-227 APPROVING AN INDEPENDENT CONTRACTOR AGREEMENT WITH CKENDALL CONSULTING, LLC**

   Documents:

   2024-10-28_2024-227_Resolution Approving Independent Contractor Agreement.pdf

2024-10-28_2024-227_Memo CKendall Inc contract 10.28.24.pdf
2024-10-28_2024-227_CKendall Inc Contractor Agreement 10.28.24.pdf

8. **RESOLUTION 2024-228 ORDERING CONSTRUCTION OF THE LINN CREEK TRAILHEAD AND BRIDGE PROJECT #TRL24001 AND #TRL24002, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND ESTIMATED COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS**

   Documents:

   2024-10-28_2024-228_Resolution Order Construction Linn Creek Trailhead and Bridge.pdf
   2024-10-28_2024-228_Memo to Order Construction for the Linn Creek Trailhead and Bridge.pdf
   2024-10-28_2024-228_TRL 24-001_TRL 24-002 6th St Trailhead and Bridge_IFB Cost Opinion.pdf
   2024-10-28_2024-228_TRL 24-001_TRL 24-002 6th St Trailhead and Bridge_IFB Notice to Bidders.pdf
   2024-10-28_2024-228_TRL 24-001_TRL 24-002 6th St Trailhead and Bridge_IFB Plans.pdf
   2024-10-28_2024-228_TRL 24-001_TRL 24-002 6th St Trailhead and Bridge_IFB Project Manual.pdf

9. **RESOLUTION 2024-229 ORDERING CONSTRUCTION OF THE LINN CREEK WATER PLAZA PROJECT #PRK22004, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND ESTIMATED COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS**

   Documents:

   2024-10-28_2024-229_Resolution Order Construction Linn Creek Water Plaza.pdf
   2024-10-28_2024-229_Memo to Order Construction for the Linn Creek Water Plaza.pdf
   2024-10-28_2024-229_PRK 22-004 Water Plaza_IFB Cost Opinion.pdf
   2024-10-28_2024-229_PRK 22-004 Water Plaza_IFB Notice to Bidders and of Hearing.pdf
   2024-10-28_2024-229_PRK 22-004 Water Plaza_IFB Plans.pdf
   2024-10-28_2024-229_PRK 22-004 Water Plaza_IFB Project Manual.pdf

10. **RESOLUTION 2024-234 APPROVING AMENDMENT 1 TO AGREEMENT FOR PROFESSIONAL SERVICES WITH BOLTON AND MENK, AN INCREASE OF $50,000, FOR THE RIVERVIEW PARK IMPROVEMENT PROJECT #PRK23001**

Documents:

2024-10-28_2024-234_Resolution Bolton Menk Contract Amendment Riverview Park Improvements.pdf
2024-10-28_2024-234_Memo Riverview Park Design Services Contract Amendment.pdf
2024-10-28_2024-234_Riverview Park Phase One - Amendment 001_REV 10.17.pdf

G. RESOLUTIONS

1. RESOLUTION 2024-230 APPROVING APPOINTMENT OF CHRISTOPHER JONES AS POLICE CHIEF FOR THE CITY OF MARSHALLTOWN, IOWA

Documents:

2024-10-28_2024-230_Resolution Appointing Chief of Police.pdf

2. RESOLUTION 2024-231 ADOPTING THE 2025-2026 GOAL SETTING REPORT FOR THE CITY OF MARSHALLTOWN, IOWA

Documents:

2024-10-28_2024-231_Resolution Adopting the City Council 2025-2026 Goal Setting Report.pdf
2024-10-28_2024-231_Memo Adopting the 2025-2026 Council Goal Setting Report.pdf
2024-10-28_2024-231_Marshalltown 2025-2026 Goal Setting Report.pdf

3. RESOLUTION 2024-232 APPROVING THE TRANSFER OF FUNDS TO THE GROUP HEALTH INSURANCE FUND 884

Documents:

2024-10-28_2024-232_Resolution Approving Transfer to Fund 884 Health Insurance.pdf
2024-10-28_2024-232_Memo to request addl transfer from Empl Benefit Fund for Health Ins Fund.pdf
2024-10-28_2024-232_Warning Notification for City of Marshalltown Health Insurance Fund.pdf

4. RESOLUTION 2024-233 APPROVING AMENDED DEVELOPMENT AGREEMENT WITH KARL OF MARSHALLTOWN, LLC

Documents:

2024-10-28_2024-233_Resolution Approve Amend Dev Agmt - Karl (Marshalltown 50 2024)-v1.pdf

2024-10-28_2024-233_Memo Amend Karl of Marshalltown DA.pdf
2024-10-28_2024-233_Amended Development Agreement (Karl) (Marshalltown 50 2024)-v1.pdf
2024-10-28_2024-233_Amended Development Agreement_MARKUP.pdf

H. ORDINANCES

1. ORDINANCE 15092 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA, BY REPEALING CHAPTER 72 PARKING RULES AND ADOPTING NEW CODE SECTIONS FOR CHAPTER 72 PARKING RULES

2ND READING

Documents:

2024-10-28_ORD 15092_Chapter 72 Parking Rules Amendment.pdf
2024-10-28_ORD 15092_Memo CH 72 Parking Pad.pdf

2. ORDINANCE 15096 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA BY AMENDING CHAPTER 77: PARKING SCHEDULES

1ST READING

Documents:

2024-10-28_ORD 15096_Amend CH 77 Parking Schedules.pdf
2024-10-28_ORD 15096_Memo - Ord Ch 77 Schedule Changes_r1.pdf
2024-10-28_ORD 15096_City Map_Snow Routes_Proposed Adds.pdf

3. PUBLIC HEARING AND ORDINANCE 15095 TO AMEND TABLE 156.B.004-1 AND SECTION 156.J.005-1(D)(1) OF THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA

2ND READING

Documents:

2024-10-28_ORD 15095_Amend Table 156.B.004-1 and Section 156.J.005.1(D)(1) (SCL 9.23.24).pdf
2024-10-28_ORD 15095_Exhibit A_Amendment Table 156.B.004-1 (SCL 9.23.24).pdf
2024-10-28_ORD 15095_Memo Chapter 156

Amendments.pdf

I. DISCUSSION

1. DISCUSSION - BROWNFIELD GRANT UPDATE

Documents:

2024-10-28_DISCUSSION1_Economic Impact Analysis - Marshalltown Brownfields Program - DRAFT.pdf
2024-10-28_DISCUSSION1_Memo - Brownfield 2024 Annual Update.pdf

2. DISCUSSION - SALE OF SURPLUS REAL PROPERTY POLICY

Presented by Councilor Gary Thompson

Documents:

Sale of Surplus Property Policy.pdf

3. DISCUSSION - DISPOSAL PROCESS FOR 817-819 N 5TH AVENUE

Documents:

2024-10-28_DISCUSSION3_Memo City Lot 817-819 N 5th Ave.pdf

J. 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
OCTOBER 14, 2024

Mayor Greer called the meeting to order at 5:30 p.m., October 14, 2024, at the City Hall Council Chambers, 10 W State Street, and led the pledge of allegiance. Roll call–Present: Fonseca, Kell, 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 Nichols to adopt the consent agenda less item 4: APPROVE MINUTES 09/23/24 AND 10/08/24 MEETINGS AND BILL LIST $3,421,894.90; REAPPOINT GARY MCKIBBIN TO THE INVESTMENT COMMITTEE, TERM 10/24/24-10/24/28; RECEIPT OF BUILDING & TRADE PERMIT REPORT-SEPTEMBER 2024; RESOLUTION 2024-213 SETTING PUBLIC HEARING FOR AN AMENDMENT TO CHAPTER 156 ZONING, TABLE 156.B.004-1 AND SECTION 156.J.005-1(D)(1); RESOLUTION 2024-214 AMENDING THE POLICY FOR THE EXAMINATION AND COPYING OF PUBLIC RECORDS; RESOLUTION 2024-215 APPROVING CONTRACT CHANGE ORDER #15, AN INCREASE OF $4,434.17, FOR THE STATE STREET RECONSTRUCTION PROJECT #STR21004; RESOLUTION 2024-216 AUTHORIZING THE CITY OF MARSHALLTOWN'S SUBMITTAL OF AN APPLICATION FOR FUNDING FROM THE TRANSPORTATION ALTERNATIVES SET-ASIDE PROGRAM TO THE DEPARTMENT OF TRANSPORTATION (DOT) FOR THE FUNDING OF THE IOWA RIVER'S EDGE TRAIL; RESOLUTION 2024-217 APPROVING AGREEMENT BY AND BETWEEN THE CITY OF MARSHALLTOWN, IOWA, AND MARSHALLTOWN FOOTBALL LEAGUE FOR THE LEASE OF THE PROPERTY DESCRIBED; RESOLUTION 2024-218 OBLIGATING FUNDS FROM URBAN RENEWAL TAX REVENUE FUND FOR APPROPRIATION TO THE PAYMENT OF ANNUAL APPROPRIATION TAX INCREMENT FINANCED OBLIGATIONS WHICH SHALL COME DUE IN THE NEXT SUCCEEDING FISCAL YEAR FOR URA2; RESOLUTION 2024-219 OBLIGATING FUNDS FROM URBAN RENEWAL TAX REVENUE FUND FOR APPROPRIATION TO THE PAYMENT OF ANNUAL APPROPRIATION TAX INCREMENT FINANCED OBLIGATIONS WHICH SHALL COME DUE IN THE NEXT SUCCEEDING FISCAL YEAR FOR URA3; RESOLUTION 2024-220 OBLIGATING FUNDS FROM URBAN RENEWAL TAX REVENUE FUND FOR APPROPRIATION TO THE PAYMENT OF ANNUAL APPROPRIATION TAX INCREMENT FINANCED OBLIGATIONS WHICH SHALL COME DUE IN THE NEXT SUCCEEDING FISCAL YEAR FOR URA4; RESOLUTION 2024-221 OBLIGATING FUNDS FROM URBAN RENEWAL TAX REVENUE FUND FOR APPROPRIATION TO THE PAYMENT OF ANNUAL APPROPRIATION TAX INCREMENT FINANCED OBLIGATIONS WHICH SHALL COME DUE IN THE NEXT SUCCEEDING FISCAL YEAR FOR URA6; RESOLUTION 2024-222 OBLIGATING FUNDS FROM URBAN RENEWAL TAX REVENUE FUND FOR APPROPRIATION TO THE PAYMENT OF ANNUAL APPROPRIATION TAX INCREMENT FINANCED OBLIGATIONS WHICH SHALL COME DUE IN THE NEXT SUCCEEDING FISCAL YEAR FOR URA7. Motion carried 7-0.

Motion by Schneider, second by Nichols to adopt RESOLUTION 2024-211 APPROVING MARSHALLTOWN POLICE DEPARTMENT FOUND BICYCLE DISPOSAL POLICY. Motion carried 7-0.

RESOLUTIONS

Motion by Schneider, second by Mitchell to adopt RESOLUTION 2024-212 SETTING A PUBLIC HEARING FOR THE CONVEYANCE AND TRANSFER OF TITLE OF CITY OWNED VACANT LOT. Alicia Hunter, City Clerk advised the high bid was $16.36. Motion failed 3-3, Fonseca, Kell, and Ladehoff dissenting; Thompson abstaining.

Motion by Schneider, second by Ladehoff to adopt RESOLUTION 2024-223 ACCEPTING BID AND AUTHORIZING THE AWARD OF CONTRACT FOR THE 6TH ST TRAIL PROJECT #TRL18002 IN THE CITY OF MARSHALLTOWN, IOWA IN THE AMOUNT OF $214,255.00 TO HOWREY CONSTRUCTION. Geoff Hubbard, Parks and Recreation Director advised the low bid was disqualified due to a computing error, the next bid was selected from Howrey Construction. Motion carried 6-1, Mitchell dissenting.

Mayor Greer opened a public hearing at 6:03 pm on the Interlocal Grant Agreement for the Iowa/Byrne-Justice Assistance Grant Program. No written or public comments were received. The public hearing was closed at 6:05 pm. Motion by Nichols, second by Schneider to adopt RESOLUTION 2024-224 APPROVING INTERLOCAL GRANT AGREEMENT FOR THE IOWA/BYRNE-JUSTICE ASSISTANCE GRANT PROGRAM (JAG) $15,764.00 SPLIT 50% WITH MARSHALL COUNTY, TO ASSIST WITH LAW ENFORCEMENT PROGRAMMING OR EQUIPMENT PURCHASES, AND APPROVAL OF MEMORANDUM OF UNDERSTANDING TO SHARE GRANT FUNDS WITH MARSHALL COUNTY. Motion carried 7-0.

ORDINANCES

Motion by Schneider, second by Mitchell to untable ORDINANCE 15092 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA, BY REPEALING CHAPTER 72 PARKING RULES AND ADOPTING NEW CODE SECTIONS FOR CHAPTER 72 PARKING RULES. Motion carried 7-0.

Motion by Nichols, second by Schneider to adopt the first reading of ORDINANCE 15092 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA, BY REPEALING CHAPTER 72 PARKING RULES AND ADOPTING NEW CODE SECTIONS FOR CHAPTER 72 PARKING RULES. Amended motion by Thompson, second by Ladehoff to allow gravel to be used for a parking pad. Motion failed 3-4, Kell, Mitchell, Nichols, and Schneider dissenting. The original motion to adopt the first reading carried 6-1, Ladehoff dissenting.

Motion by Schneider, second by Ladehoff to adopt the third reading of ORDINANCE 15093 AMENDING ORDINANCE NO. 13657 RELATING TO PARTIAL PROPERTY TAX EXEMPTIONS FOR INDUSTRIAL PROPERTY ON WHICH IMPROVEMENTS HAVE BEEN MADE, PROVIDING A SCHEDULE OF TAX EXEMPTION AND SETTING FOR THE PROCEDURE TO OBTAIN SAME. Motion carried 7-0.

Motion by Schneider, second by Mitchell to adopt the first reading of ORDINANCE 15094 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA CHAPTER 118 PEDDLERS, SOLICITORS, TRANSIENT MERCHANTS DEFINITIONS AND FEES. Motion carried 7-0.

Motion by Thompson, second by Schneider to waive the second and third readings of ORDINANCE 15094 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA CHAPTER 118 PEDDLERS, SOLICITORS, TRANSIENT MERCHANTS DEFINITIONS AND FEES. Motion carried 7-0.

Motion by Schneider, second by Kell to adopt the first reading of ORDINANCE 15095 TO AMEND TABLE 156.B.004-1 AND SECTION 156.J.005-1(D)(1) OF THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA. Jon Boston, Plan and Zoning Commission Chair advised this amendment will remove the public hearing requirement with Plan and Zoning on special use permits and only require it for the Board of Adjustment and also corrects a table with some missing information from the zoning rewrite. Motion carried 7-0.

DISCUSSION

Heather Thomas, Public Works Director, and Deb Millizer, Director of Marshalltown Central Business District presented an expansion of the current Code and Façade Grant Programs to include ADA accessibility upgrades and safety and security upgrades for lighting, garbage/refuse enclosure, and security cameras in the district. Motion by Nichols, second by Mitchell to proceed with planning the implementation of these programs. Motion carried 7-0.

CLOSED SESSION

Motion by Kell, second by Nichols to enter into closed session pursuant to Section 21.5 subsection (1) paragraph (j) of the Code of Iowa to discuss the disposition of real estate where premature disclosure could be reasonably expected to change the price the governmental body would receive for Properties 1-7. The City of Marshalltown has an attorney-client relationship with Lynch Dallas P.C., by Council Resolution 2022-161, approved 06/13/22 who has approved the reason for this closed session. There may be council action by motion following the closed session. Motion carried 7-0 and the council entered into closed session at 6:59 pm. Motion by Schneider, second by Nichols to exit closed session. Motion carried 7-0 and the council returned to open session at 7:52 pm. Motion by Thompson, second by Nichols to proceed as discussed in the closed session. Motion carried 7-0.

ADJOURNMENT

The meeting adjourned at 7:53 p.m.

Respectfully Submitted,

Alicia Hunter

Alicia Hunter, City Clerk

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Alicia Hunter, City Clerk

BILL LIST 10/28/24

Advertising	
FirstIntBank/4	1,010.18
Consulting & Professional Fees	
Bernie.Lowe/2	68.89
Bolton&Menk.Inc/3	63,036.50
CottinghamButle/1	275.00
FirstIntBank/1	75.00
FOX Strand/1	7,378.31
Health.Partners/2	12,268.26
Iowa.One.Call/3	513.60
J&M Fabrication/1	26.46
Contracts	
AAA.Septic/1	445.00
ARL/1	7,210.67
Backflow.Preven/2	200.00
BG.HVAC.INC/1	162.79
Boland.Recreati/1	28,200.00
Cal-Cert.Co/1	1,120.00
City.Laundering/3	271.82
Construct/1	246,193.61
Electric.Pump/1	16,991.00
Eocene Envir Gr/2	23,695.00
FirstIntBank/5	481.25
Gervich.Sons/1	160.00
IA.Dept.Insp.Ap/1	809.78
Locality Media/1	16,702.88
Marsh.Co.Landfi/1	23.80
Menards/6	81.28
MRI.Software/1	2,790.00
Prairie Waste/13	2,399.03
Premier.Equip/1	348.74
Region 6/1	1,461.00
Schendel.Pest.C/5	168.40
Servicemaster/1	1,934.00
Xerox Corp/1	25.26
Ziegler/5	5,774.00
Debt Service	
UMB.Bank.NA/3	1,200.00
Equipment/Minor	
Jetco Inc/1	645.00
Library Books	
Baker & Taylor/28	3,037.54
Boundurant Lib/1	18.00
BRODART.CO/5	920.30
Cengage.Learng/4	431.08
FirstIntBank/30	1,293.18
Playaway Prod/1	59.84
Medical	
Bernie.Lowe/2	234.47
Health.Partners/7	176,804.99
Hunter Lane LLC/1	1,624.31
Payroll.Net	
Payroll/1	349,515.97
Refund/Reimbursed	
Baker & Taylor/1	17.10
City 6th St MFL/1	719.59
Custom Electric/1	85.00
DeHidalgo, Mild/1	185.00
FirstIntBank/4	90.12
Hser, Doh Doh/1	7.99
Laugerman,Deann/1	10.99
PENWORTHY.CO/1	294.90
Treas.State.IA/5	81.97
Vargas, Rosa/1	185.00
Rents/Leases	
Gray,D/1	490.00
Service/Repairs	
Arnold.Motor/1	29.20
BG.HVAC.INC/1	484.00
Bly,Josh/2	690.00
Cline, Troy/7	3,155.50
Cntrl.IA.Machin/1	409.45
CTI Ready Mix/1	720.00
Ed.M.Feld.Eq/1	522.00
Eocene Envir Gr/1	7,140.00
FirstIntBank/63	5,647.67
Global Paymt/1	584.74
Granite Telecom/35	3,067.61
Hogeland.Auto.P/2	440.00
HydraQuip/2	1,710.87
IA Irrigation/1	385.88
IA.Treasurer/3	15,704.72
KB Excavating L/1	1,550.00
LARRY'S.TOWING/1	75.00
LENZ,D/1	495.00
McAtee.Tire/1	858.95
Menards/2	27.29
Mobotrex.Inc./1	472.00
MRI.Software/2	24.00
Mtwn.Wtrwrks/3	9,722.68
Municipal Pipe/1	95,539.32
Mustaine's Tow/1	363.00
T.S.Y.S./2	175.53
Treas.State.IA/6	135.00
Verizon.Wireles/2	122.52
WW.Grainger/1	59.00
Sewer Refund	
Treas.State.IA/1	26.44
Supplies/Parts	
4 Seasons Trail/1	390.00
AdlandEngraving/1	943.50
Allison, Kaden/2	350.00
Arnold.Motor/14	1,265.03
Barco.MuniProd/1	1,490.80
BDH/2	9.97
Bitumnous/2	1,031.32
BSN.Sports/1	1,063.50
City.Laundering/6	184.23
Cntrl.IA.Machin/1	335.00
CTI Ready Mix/5	4,249.75

BILL LIST 10/28/24

Doors.Inc/1	198.88
Electric.Pump/1	695.56
Engineered Equi/3	32,387.63
Fastenal.Co/1	58.47
Fire Serv Trn/1	50.00
FirstIntBank/117	17,983.23
Galls Parent Ho/5	1,779.19
Hydro Dyne Eng/1	483.57
HyVee.Accts/1	12.27
IA.D.O.T/2	531.00
J&M Fabrication/1	1,764.00
Karl of Mtown/2	201.64
Kriss.Premium/1	359.51
Logan.Contract/1	301.72
Macqueen.Equip/2	270.97
Marsh.Co.Engr/24	18,366.36
Martin.Marietta/1	292.08
McAtee.Tire/1	515.37
Menards/11	591.00
Michael Todd&Co/2	175.65
Microbac Lab/1	122.00
Midland.Scienti/4	1,228.74
Northern.Lights/1	332.95
Northern.Tool.E/1	1,129.00
Nutrien.Ag.Sol/2	935.40
Racom.Corp/1	37.75
Ranson,R/1	76.64
ShoBiz,Minutema/2	27.56
Sign.Creations/1	2,646.00
SMI.Co/2	3,525.00
Sunset.Law.Enf/1	1,337.80
Thiesens.Supply/8	414.48
Tri.State.Lock/2	240.00
Vajgrt.R/1	65.00
Wendling.Quarri/1	1,658.11
WW.Grainger/4	710.36
Taxes Paid	
IA.Treasurer/1	25.39
Travel/Training	
Cayler, Jeffrey/1	3,937.22
FirstIntBank/43	5,729.76
Guy, Brian/1	187.60
Larson, Geralyn/1	16.24
Logan,J/1	129.98
Molitor,Jacob/1	40.00
Ranson,R/2	172.82
Teske, Trey/1	366.75
Utilities	
Alliant.Energy/58	41,058.74
ConsumersEnergy/3	405.00
I.R.U.A./1	172.54
WoodRiver.Enrgy/1	114.02
Wage Assignment	
American.Educa./1	64.41
Collection.Svs./5	1,228.86
Colonial.Life/1	242.28
Fidelity.Securt/2	478.20
FirstIntBank/12	177.31
I.P.E.R.S./9	91,012.76
I.R.S./10	93,115.13
IA.Treasurer/2	18,268.91
ICMA457Mission/11	13,790.04
M.F.P.R.S.I./4	134,481.22
Patterson,Debra/1	60.00
Ranson,R/1	100.00
TotalAdmin.Serv/4	6,928.51
United.Way/4	1,380.30
Work Comp	
IA.Workforce/1	44.20
Total/757	**1,647,137.40**

BILL LIST 10/28/24

Account Number	Vendor Name	Description (Item)	Amount
110.2010.5565.000	4 Seasons Trailers Inc	Street trailer spare wheel, light box	$ 390.00
001.4030.5342.000	AAA SEPTIC SERVICE INC	Mega 10 Parks and West End Park	$ 445.00
001.4041.5613.000	Adland Engraving	Park youth basketball tee shirts	$ 943.50
001.1030.5481.000	Alliant Energy	2801 S 12th St EMG Sirens	$ 23.01
001.1030.5481.000	Alliant Energy	25 N Center St Civil Defense Sirens	$ 100.00
001.1030.5481.000	Alliant Energy	Tornado siren	$ 14.82
001.2020.5481.000	Alliant Energy	NE corner S 1st Ave / Church St parking lot	$ 28.65
001.4010.5481.000	Alliant Energy	Library - 105 W Boone St	$ 3,329.05
001.4030.5481.000	Alliant Energy	Riverview Park east side	$ 157.45
001.4030.5481.000	Alliant Energy	402 Woodland St Bath House	$ 632.28
001.4030.5481.000	Alliant Energy	802 S 3rd St Skate Park	$ 18.45
001.4030.5481.000	Alliant Energy	108 N 2nd Ave Alley - Farmers Market	$ 21.60
001.4030.5481.000	Alliant Energy	JUDGE PARK	$ 20.55
001.4030.5481.000	Alliant Energy	801 WOODLAND ST SHOP	$ 51.99
001.4030.5481.000	Alliant Energy	602 W Merle Hibbs Blvd	$ 20.16
001.4030.5482.000	Alliant Energy	402 Woodland St Bath House	$ 42.63
001.4030.5482.000	Alliant Energy	Reunion Hall	$ 31.30
001.4030.5482.000	Alliant Energy	905 E MAIN ST PARK SHOP	$ 31.30
001.4030.5482.000	Alliant Energy	402 Woodland St Comm Bldg	$ 31.30
001.4065.5481.000	Alliant Energy	10 W State St COLISEUM	$ 3,743.31
001.4065.5482.000	Alliant Energy	10 W State St COLISEUM	$ 89.37
001.6050.5481.000	Alliant Energy	24 N Center St Municipal Bldg	$ 106.77
001.6051.5481.000	Alliant Energy	36 N Center St- Carnegie Bldg	$ 807.66
001.6051.5482.000	Alliant Energy	36 N Center St- Carnegie Bldg	$ 67.92
110.2010.5481.000	Alliant Energy	2107 S Center St irrigation system	$ 20.05
110.2030.5481.000	Alliant Energy	407 Player St Bridge Light	$ 78.01
110.2030.5481.000	Alliant Energy	HWY 14 & HWY 30 St Lights	$ 83.75
110.2030.5481.000	Alliant Energy	17 N Center St metered	$ 29.45
110.2030.5481.000	Alliant Energy	220 E Main St alley	$ 43.43
110.2030.5481.000	Alliant Energy	404 1/2 S Center St Viaduct	$ 83.38
110.2030.5481.000	Alliant Energy	211 S 9th St Front Terrace	$ 19.55
110.2030.5481.000	Alliant Energy	36 E Main St Alley	$ 42.64
110.2030.5481.000	Alliant Energy	120 E MAIN ST ALLEY	$ 45.49
110.2030.5481.000	Alliant Energy	MARKET ST BRIDGE LIGHTS	$ 73.67
110.2040.5481.000	Alliant Energy	S Center St & W Berle	$ 38.83
110.2040.5481.000	Alliant Energy	219 Westwood flashing lights	$ 22.09
110.2040.5481.000	Alliant Energy	E Anson St cnr 4th Ave	$ 22.09
110.2040.5481.000	Alliant Energy	5 N 5th St cnr State St	$ 22.09
110.2040.5481.000	Alliant Energy	N 18TH AVE & E MAIN	$ 27.73
110.2040.5481.000	Alliant Energy	S Center St cnr Boone St	$ 45.02
110.2040.5481.000	Alliant Energy	13 S 13th St cnr Main St	$ 42.28
110.2040.5481.000	Alliant Energy	S 12TH AVE E OLIVE ST	$ 36.38
110.2040.5481.000	Alliant Energy	S Center St North of Mall	$ 45.29
110.2040.5481.000	Alliant Energy	S CENTER ST CNR LINN	$ 35.64
110.2040.5481.000	Alliant Energy	W Southridge Rd Cnr Center	$ 37.02
110.2040.5481.000	Alliant Energy	S Center St Cnr Hibbs	$ 41.50
110.2040.5481.000	Alliant Energy	Riverside Dr cnr 3rd Ave	$ 30.55
110.2040.5481.000	Alliant Energy	502 E Southridge Rd	$ 19.34
610.8015.5481.000	Alliant Energy	N 3rd Ave River Sign	$ 21.08
610.8015.5481.000	Alliant Energy	Riverview Park liftstation	$ 19.20
610.8015.5481.000	Alliant Energy	1001 Woodland St Water Pollution	$ 24,631.77
610.8015.5481.000	Alliant Energy	JBS 402 N 10TH AVE	$ 21.77
610.8015.5482.000	Alliant Energy	1001 WOODLAND ST DISP PLANT	$ 1,678.90
610.8016.5481.000	Alliant Energy	608 Turner St Pump Station	$ 145.32
610.8016.5481.000	Alliant Energy	S 12TH AVE CNR E MAIN	$ 94.85
610.8016.5481.000	Alliant Energy	Marion St - WPCP	$ 98.17
610.8016.5481.000	Alliant Energy	1511 Rolling Meadows Rd	$ 161.33
610.8016.5482.000	Alliant Energy	1001 Woodland St Shed	$ 32.50
740.8065.5481.000	Alliant Energy	301 N 18TH AVE LIFTSTATION	$ 3,538.54
740.8065.5481.000	Alliant Energy	N 3rd Ave - WPCP	$ 206.75
750.8070.5481.000	Alliant Energy	901 Woodland St Compost Pile	$ 53.72
001.4030.5132.000	Allison, Kaden	Employee clothing	$ 278.01
001.4030.5132.000	Allison, Kaden	Employee clothing	$ 71.99
999.1121.000	American Education Services	Wage Withholdings	$ 64.41

001.1090.5331.000	Animal Rescue League	Annual contract -animals within city limits Novemb	$	7,210.67
001.4010.5410.000	Arnold Motor Supply	Library exhaust fan belts	$	29.20
001.4030.5565.000	Arnold Motor Supply	Parks Traverse oil filter	$	12.09
001.4030.5565.000	Arnold Motor Supply	Parks 703 support body mount	$	106.71
001.4030.5565.000	Arnold Motor Supply	Parks 702 brakes, rotors, bearings	$	686.37
001.4030.5565.000	Arnold Motor Supply	Parks 703 support body mount	$	106.71
001.4030.5565.000	Arnold Motor Supply	Parks 703 caliper/ bracket	$	134.72
110.2010.5565.000	Arnold Motor Supply	core deposit	$	(20.00)
110.2010.5565.000	Arnold Motor Supply	Street truck 46 alternator	$	152.72
110.2010.5600.000	Arnold Motor Supply	Street boxed clamp	$	1.48
110.2010.5600.000	Arnold Motor Supply	Street truck 46 boxed clamp	$	1.48
110.2010.5600.000	Arnold Motor Supply	hydraulic couplers	$	24.60
110.2010.5600.000	Arnold Motor Supply	Street truck 46 switch	$	9.30
110.2010.5600.000	Arnold Motor Supply	Street truck 46 10MB-8MP	$	9.77
110.2010.5600.000	Arnold Motor Supply	Street truck 36 10MP-8MP	$	29.31
110.2010.5600.000	Arnold Motor Supply	Street truck 36 10MB-8MP	$	9.77
001.6050.5342.000	B&G HVAC INC	City Hall rooftop AC unit repair	$	162.79
610.8015.5410.000	B&G HVAC INC	WPCP Admin bldg A/C repair	$	484.00
610.8016.5344.000	Backflow Prevention Services of Iowa	1001 Woodland St & Sewer dept annual inspection	$	120.00
740.8065.5344.000	Backflow Prevention Services of Iowa	1001 Woodland St & Sewer dept annual inspection	$	80.00
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	$	47.29
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	168.64
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	$	3.59
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	46.77
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	17.09
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	60.35
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	446.79
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	11.39
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	27.88
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	17.09
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	33.62
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	496.36
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	$	166.02
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	17.09
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	127.46
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	96.32
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	164.62
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	23.74
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	19.00
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	22.80
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	174.72
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	11.39
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	714.41
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	11.97
030.4010.5732.000	Baker & Taylor Inc	Adult non fiction or fiction books	$	60.41
170.4010.5734.000	Baker & Taylor Inc	Memorial book- Porter	$	17.10
110.2010.5627.000	Barco Municipal Products Inc	Street -orange cones	$	1,490.80
610.8016.5612.000	BDH INFORMATION TECHNOLOGY LLC	Bluetooth adapter- Hailey comp	$	5.98
740.8065.5612.000	BDH INFORMATION TECHNOLOGY LLC	Bluetooth adapter- Hailey comp	$	3.99
881.1010.5339.000	BERNIE LOWE & ASSOC Inc	Paid medical claims	$	89.14
881.1050.5230.000	BERNIE LOWE & ASSOC Inc	Paid medical claims	$	23.22
881.1050.5230.000	BERNIE LOWE & ASSOC Inc	Paid medical claims	$	45.67
881.1050.5339.000	BERNIE LOWE & ASSOC Inc	Paid medical claims	$	145.33
110.2010.5617.000	Bitumnous Materials & Supply	Amiseal	$	530.95
110.2010.5617.000	Bitumnous Materials & Supply	emulsified asphalt	$	500.37
001.4030.5386.000	Bly, Josh	Parks contract mowings	$	550.00
740.8067.5386.000	Bly, Josh	Parks contract mowings	$	140.00
030.4030.5750.000	BOLAND RECREATION INC	TImber Creek Playground - Sourcewell 183512	$	28,200.00
311.2012.5233.000	Bolton & Menk Inc	Edgewood Street Extension 8/3/24-8/30/24	$	964.00
363.2012.5233.000	Bolton & Menk Inc	Professional Serv - State St Recon 8/3/24-8/30/24	$	39,936.50
364.2012.5233.000	Bolton & Menk Inc	Design & Bidding Dwntwn Ph 2A & 2B 8/3/24-8/30/24	$	22,136.00
001.4010.5733.000	Bondurant Community Library	replacement cost for lost book	$	18.00
030.4010.5732.000	Brodart Co	Juvenile books	$	99.90
030.4010.5732.000	Brodart Co	Juvenile books	$	220.76
030.4010.5732.000	Brodart Co	Juvenile books	$	219.16

030.4010.5732.000	Brodart Co	Juvenile books	$	65.24
030.4010.5732.000	Brodart Co	Juvenile books	$	315.24
001.4041.5600.000	BSN SPORTS	150 red rubber basketballs	$	1,063.50
110.2060.5344.000	Cal-Cert Co	calibration for concrete test machine 10/1/24-9/25	$	1,120.00
001.1010.5475.000	CAYLER, JEFFREY	Police Chief assessment center process	$	3,937.22
170.4010.5732.000	CENGAGE LEARNING INC	Tye grant books	$	98.21
170.4010.5732.000	CENGAGE LEARNING INC	Tye grant books	$	83.96
170.4010.5732.000	CENGAGE LEARNING INC	Tye grant books	$	97.46
170.4010.5732.000	CENGAGE LEARNING INC	Tye grant books	$	151.45
110.2010.5410.000	Central Iowa Machine Shop Inc	Street - weld cast iron pump	$	409.45
110.2010.5600.000	Central Iowa Machine Shop Inc	Street dept purchase fasteners	$	335.00
610.8015.5980.000	City 6th St Complex MFL	Sewer refund irrigation at MFL fields	$	719.59
110.2010.5342.000	CITY LAUNDERING COMPANY	cleaning and insurance	$	124.26
110.2010.5342.000	CITY LAUNDERING COMPANY	cleaning and insurance	$	23.30
110.2010.5342.000	CITY LAUNDERING COMPANY	cleaning and insurance	$	124.26
110.2010.5600.000	CITY LAUNDERING COMPANY	supplies	$	20.24
110.2010.5600.000	CITY LAUNDERING COMPANY	supplies	$	20.24
110.2010.5600.000	CITY LAUNDERING COMPANY	supplies	$	20.24
690.8050.5132.000	CITY LAUNDERING COMPANY	Transit dept - uniform cleaning	$	41.17
690.8050.5132.000	CITY LAUNDERING COMPANY	Transit dept - uniform cleaning	$	41.17
690.8050.5132.000	CITY LAUNDERING COMPANY	Transit dept - uniform cleaning	$	41.17
001.1075.5261.000	Cline, Troy	City owned properties- clean up dumped tires	$	90.00
001.1075.5261.000	Cline, Troy	land fill fee	$	120.00
001.1075.5261.000	Cline, Troy	landfill fees	$	472.00
001.1075.5261.000	Cline, Troy	nuisance clean up/ abatement	$	1,128.50
001.1075.5263.000	Cline, Troy	nuisance clean up/ abatement	$	220.00
001.1075.5263.000	Cline, Troy	City owned nuisance properties- mowing	$	630.00
001.1075.5263.000	Cline, Troy	nuisance mowing and trimming	$	495.00
999.1121.000	COLLECTION SERVICES CENTER	Child Support	$	139.77
999.1121.000	COLLECTION SERVICES CENTER	Child Support	$	423.86
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
999.1133.000	COLONIAL LIFE	COLONIAL LIFE INSURANCE	$	242.28
363.2012.5342.000	CONSTRUCT INC	STR21004 State St Recons 9/1/24-9/30/24	$	246,193.61
110.2030.5481.000	Consumers Energy Coop	City of Marshalltown	$	70.65
110.2030.5481.000	Consumers Energy Coop	City of Marshalltown	$	81.17
110.2040.5481.000	Consumers Energy Coop	City of Marshalltown	$	253.18
690.8050.5230.000	Cottingham & Butler Insurance Services Inc	Civil service review- Transit operator	$	275.00
364.2020.5348.000	CTI Ready Mix Inc	Flowable to abandon old SanSew manhole	$	720.00
610.8016.5600.000	CTI Ready Mix Inc	Street lateral repairs S 6th St	$	2,832.00
740.8065.5600.000	CTI Ready Mix Inc	8th & State St storm sewer repair	$	365.50
740.8065.5600.000	CTI Ready Mix Inc	8th & State St storm sewer repair	$	321.25
740.8065.5600.000	CTI Ready Mix Inc	4th & State St storm sewer repair	$	409.75
740.8065.5600.000	CTI Ready Mix Inc	4th & State St storm sewer repair	$	321.25
001.1070.5980.000	Custom Electrical Services	2221 Marshalltown Blvd	$	85.00
001.4030.5980.000	DeHidalgo Mildren	Community Bldg rental	$	185.00
001.1099.5611.000	Doors Inc	P&F bldg blank keys	$	198.88
001.1050.5410.000	ED M FELD EQUIPMENT CO INC	Fire dept SCBA repairs	$	522.00
610.8016.5615.000	ELECTRIC PUMP INC	parts for Rolling Meadows lift station	$	695.56
610.8016.5765.000	ELECTRIC PUMP INC	YMCA LS Flygt 3153 Pump Rebuild	$	16,991.00
610.8015.5600.000	Engineered Equipment Solutions LLC	WPCP 2 husky grease pails	$	600.00
610.8015.5600.000	Engineered Equipment Solutions LLC	SBR Grease Pail	$	900.00
610.8015.5718.000	Engineered Equipment Solutions LLC	SBR Membranes	$	30,887.63
133.2900.5342.000	Eocene Environmental Group Inc	EPA Brownfields Assistance Program	$	4,207.50
181.3040.5342.000	Eocene Environmental Group Inc	Lead Hazard Reduction program (2023)	$	19,487.50
181.3040.5415.000	Eocene Environmental Group Inc	HH:Lead Hazard Reduction program (2023)	$	7,140.00
610.8015.5600.000	FASTENAL COMPANY	WPCP Rivets	$	58.47
999.1125.000	FIDELITY SECURITY LIFE INSURANCE CO	VISION INSURANCE	$	337.36
999.1125.000	FIDELITY SECURITY LIFE INSURANCE CO	VISION INSURANCE	$	140.84
001.1050.5460.000	Fire Services Training Bureau	Certification fees for Fire officer II	$	50.00
001.1010.4875.000	First Interstate Bank	Fairfield Inn - vendor savings program	$	(75.77)
001.1010.4875.000	First Interstate Bank	Caseys- vendor and bank savings program	$	(0.06)
001.1010.4875.000	First Interstate Bank	Panda Express vendor savings program	$	(3.18)
001.1010.5132.000	First Interstate Bank	CopQuest employee clothing	$	155.00
001.1010.5132.000	First Interstate Bank	Galls- PD employee clothing	$	128.85
001.1010.5132.000	First Interstate Bank	Zero9 Holders - PD radio case	$	66.99
001.1010.5132.000	First Interstate Bank	Midway USA - PD ammo pouches	$	178.16

001.1010.5132.000	First Interstate Bank	Safariland- PD holster parts	$	118.15
001.1010.5230.000	First Interstate Bank	Trans Union intel requets	$	75.00
001.1010.5280.000	First Interstate Bank	CANVA digital creator monthly subscription	$	14.99
001.1010.5360.000	First Interstate Bank	HyVee- PD postage	$	10.10
001.1010.5360.000	First Interstate Bank	Stamps.com- PD monthly online fee	$	19.99
001.1010.5360.000	First Interstate Bank	Minuteman PD postage	$	69.82
001.1010.5370.000	First Interstate Bank	Vistaprint- Svoboda business cards	$	41.98
001.1010.5370.000	First Interstate Bank	Vistaprint PD Business cards	$	41.98
001.1010.5410.000	First Interstate Bank	Farmtek- white repair tape	$	12.78
001.1010.5460.000	First Interstate Bank	Chamber Leadership Conf- Ortiz-Diaz	$	900.00
001.1010.5460.000	First Interstate Bank	Iowa Police Chiefs Admin conf- Vaughn	$	60.00
001.1010.5460.000	First Interstate Bank	Hillers conference registration	$	325.00
001.1010.5464.000	First Interstate Bank	Pigwich- Hillers meal during training	$	25.15
001.1010.5464.000	First Interstate Bank	Yard House- Hillers meal during training	$	44.77
001.1010.5464.000	First Interstate Bank	KC Mariott- Hillers meal during training	$	18.64
001.1010.5464.000	First Interstate Bank	Jason's Deli Hillers & Allen meal during training	$	30.42
001.1010.5464.000	First Interstate Bank	KC Mariott Hillers/ Allen meal during training	$	51.19
001.1010.5464.000	First Interstate Bank	Burger Kitchen Hillers/ Allen meal during training	$	61.88
001.1010.5464.000	First Interstate Bank	Yard House- Hillers/ Allen meal during training	$	35.83
001.1010.5464.000	First Interstate Bank	Picklemans Gourmet Hillers meal during training	$	12.29
001.1010.5464.000	First Interstate Bank	KD Mariott Hillers/Allen meal during training	$	10.73
001.1010.5464.000	First Interstate Bank	Pizza Bar Hillers/Allen meal during training	$	7.02
001.1010.5464.000	First Interstate Bank	Pizza Bar Hillers/Allen meal during training	$	28.07
001.1010.5464.000	First Interstate Bank	Planet Sub- Hillers/ Allen meal during training	$	25.59
001.1010.5464.000	First Interstate Bank	KC Marriott- Hillers/ Allen meal during training	$	10.73
001.1010.5464.000	First Interstate Bank	Freddys -Hillers/ Allen meal during training	$	25.32
001.1010.5464.000	First Interstate Bank	Raising Canes- Teske meal during training	$	11.76
001.1010.5464.000	First Interstate Bank	Walmart - Teske meal during training	$	29.00
001.1010.5464.000	First Interstate Bank	Panda Express Teske meal during training	$	12.09
001.1010.5464.000	First Interstate Bank	Chick-fil-A Teske meal during training	$	13.98
001.1010.5464.000	First Interstate Bank	Subway - Teske meal during training	$	14.42
001.1010.5464.000	First Interstate Bank	Walmart- Teske meal during training	$	4.09
001.1010.5464.000	First Interstate Bank	Panda Express Teske meal during training	$	10.49
001.1010.5464.000	First Interstate Bank	Chick-Fil-A Teske meal during training	$	18.49
001.1010.5464.000	First Interstate Bank	Panda Express Teske meal during training	$	12.09
001.1010.5464.000	First Interstate Bank	Panda Express Tekse meal during training	$	16.69
001.1010.5464.000	First Interstate Bank	Walmart Teske meal during training	$	14.16
001.1010.5464.000	First Interstate Bank	Olive Garden	$	29.00
001.1010.5464.000	First Interstate Bank	SubwayTeske meal during training	$	15.89
001.1010.5464.000	First Interstate Bank	Chick-Fil-A Teske meal during training	$	14.84
001.1010.5464.000	First Interstate Bank	Panda Express Teske meal during training	$	14.00
001.1010.5464.000	First Interstate Bank	Panda Express Teske meal during training	$	14.23
001.1010.5464.000	First Interstate Bank	Applbees Teske meal during training	$	29.00
001.1010.5464.000	First Interstate Bank	Walmart Teske meal during training	$	17.24
001.1010.5464.000	First Interstate Bank	KC Mariott -Hillers meal during training	$	13.56
001.1010.5465.000	First Interstate Bank	Fairfield Hotel - Teske basic training	$	398.72
001.1010.5465.000	First Interstate Bank	Fairfield Hotel PD Teske basic training	$	498.40
001.1010.5465.000	First Interstate Bank	Fairfield Hotel- PD Teske basic training	$	498.40
001.1010.5465.000	First Interstate Bank	Fairfield Hotel - PD Teske basic training	$	498.40
001.1010.5465.000	First Interstate Bank	KC Dowtown Mariott-Hllers/Allen hotel training	$	1,109.70
001.1010.5475.000	First Interstate Bank	Hampton Inn- PD Chief candidate	$	350.56
001.1010.5565.000	First Interstate Bank	Karl of Marshalltown - PD auto part	$	51.90
001.1010.5570.000	First Interstate Bank	Kimmes Cherokee County- PD gasoline	$	46.00
001.1010.5570.000	First Interstate Bank	Minit Mart- Hillers/ Allen fuel- training trip	$	45.44
001.1010.5600.000	First Interstate Bank	MEnards Fire dept folding table	$	49.97
001.1010.5600.000	First Interstate Bank	Amazon - PD batteries	$	178.91
001.1010.5600.000	First Interstate Bank	Office EX PD towels, trash cans, towel dispeners	$	712.23
001.1010.5600.000	First Interstate Bank	DJI Drones- propellers	$	19.26
001.1010.5600.000	First Interstate Bank	Amazon - PD Batteries	$	166.44
001.1010.5600.000	First Interstate Bank	Amazon - PD batteries	$	38.04
001.1010.5600.000	First Interstate Bank	Amazon - PD batteries	$	27.98
001.1010.5600.000	First Interstate Bank	Amazon - sled hauler for patrol	$	31.99
001.1010.5600.000	First Interstate Bank	Amazon - PD weapon lights and key cabinet	$	23.98
001.1010.5600.000	First Interstate Bank	Walmart -computer cord	$	8.46
001.1010.5600.000	First Interstate Bank	Amazon - PD vacuum	$	133.34
001.1010.5601.000	First Interstate Bank	4Imprint - PD promo items- sunglasses	$	566.09
001.1010.5605.000	First Interstate Bank	Office Express permanent markers	$	49.12
001.1010.5605.000	First Interstate Bank	Staples - copy paper	$	188.05

001.1010.5605.000	First Interstate Bank	Amazon correction tape, desk calendar	$	35.33
001.1010.5718.000	First Interstate Bank	BatteWerx- firearm maintenance items	$	69.84
001.1010.5718.000	First Interstate Bank	Safariland PD gun maintenance	$	60.50
001.1050.5450.000	First Interstate Bank	Fire dept ATT/Firstnet invoice	$	573.07
001.1050.5460.000	First Interstate Bank	2024 That D.A.M. Fire training- Simms	$	150.00
001.1050.5460.000	First Interstate Bank	Fire dept That D.A.M. fire training- Warnell	$	50.00
001.1050.5600.000	First Interstate Bank	Amazon American Flag for Fire dept	$	475.99
001.1050.5600.000	First Interstate Bank	Amazon Fire dept canopy tent	$	223.97
001.1050.5600.000	First Interstate Bank	Office Express Fire dept laundry soap	$	72.00
001.1050.5605.000	First Interstate Bank	Staples Fire dept office supplies	$	83.88
001.1071.5360.000	First Interstate Bank	USPS Rental Inspection	$	38.08
001.1071.5360.000	First Interstate Bank	USPS-Sect 8, Rental and Nuisance	$	100.00
001.1071.5360.000	First Interstate Bank	USPS Sect 8, Rental, Nuisance	$	100.00
001.1071.5360.000	First Interstate Bank	USPS Sect 8, Rental and Nuisance postage	$	100.00
001.1075.5360.000	First Interstate Bank	USPS-Sect 8, Rental and Nuisance	$	100.00
001.1075.5360.000	First Interstate Bank	USPS Sect 8, Rental, Nuisance	$	100.00
001.1075.5360.000	First Interstate Bank	USPS Sect 8, Rental and Nuisance postage	$	100.00
001.1075.5450.000	First Interstate Bank	Nuisance dept iPad	$	41.27
001.1075.5600.000	First Interstate Bank	Vistaprint -business cards-Clawson	$	15.49
001.1075.5600.000	First Interstate Bank	Sams Club- 3"wide 3 drawer lateral file cabinet	$	249.50
001.1099.5410.000	First Interstate Bank	Supply House P&F bldg toilet repairs	$	72.73
001.2020.5600.000	First Interstate Bank	Vistaprint -business cards-Clawson	$	15.49
001.2020.5600.000	First Interstate Bank	Sams Club- 3"wide 3 drawer lateral file cabinet	$	249.50
001.4010.5210.000	First Interstate Bank	library program advertising	$	37.00
001.4010.5210.000	First Interstate Bank	board member photo	$	250.00
001.4010.5342.000	First Interstate Bank	Bi-monthly pest control	$	66.81
001.4010.5360.000	First Interstate Bank	postage	$	13.91
001.4010.5360.000	First Interstate Bank	postage	$	5.11
001.4010.5360.000	First Interstate Bank	postage	$	9.51
001.4010.5360.000	First Interstate Bank	postage	$	14.62
001.4010.5360.000	First Interstate Bank	postage	$	14.62
001.4010.5380.000	First Interstate Bank	postage machine rental	$	11.00
001.4010.5450.000	First Interstate Bank	internet	$	135.14
001.4010.5450.000	First Interstate Bank	AT&T charges	$	33.52
001.4010.5470.000	First Interstate Bank	Iowa Library Association conference fee	$	275.00
001.4010.5600.000	First Interstate Bank	tissue, soap, batteries	$	84.18
001.4010.5601.000	First Interstate Bank	lemonade for movies	$	7.47
001.4010.5605.000	First Interstate Bank	envelope sealer	$	7.39
001.4010.5605.000	First Interstate Bank	envelope sealer	$	9.12
001.4010.5731.000	First Interstate Bank	Pioneer Woman magazine	$	29.97
001.4030.5410.000	First Interstate Bank	Strands Paint -graffitti cover paint	$	129.28
001.4030.5410.000	First Interstate Bank	Farmtek- white repair tape	$	19.17
001.4030.5465.000	First Interstate Bank	Best Western Starlite-hotel IPRA conference	$	221.76
001.4030.5565.000	First Interstate Bank	Larrys Towing - #818 trailer tires	$	400.00
001.4030.5565.000	First Interstate Bank	Larrys Tire mower tire and repairs	$	115.00
001.4030.5570.000	First Interstate Bank	Caseys 91C gas for Parks	$	149.41
001.4030.5605.000	First Interstate Bank	Amazon - office supplies	$	8.77
001.4040.5600.000	First Interstate Bank	TriState Lock- keys for pool	$	32.10
001.4041.5465.000	First Interstate Bank	Best Western Starlite- IPRA conference	$	221.76
001.4041.5600.000	First Interstate Bank	Amazon Parks- wireless microphone	$	39.99
001.4045.5251.000	First Interstate Bank	ASCAP Aquatic Center musak license	$	442.17
001.4045.5410.000	First Interstate Bank	Amazon - Aquatic Ctr light clips	$	18.49
001.4045.5410.000	First Interstate Bank	Amazon -Aquatic Ctr light clips	$	18.49
001.4045.5410.000	First Interstate Bank	Grainger -pool pump protector WPCP	$	266.48
001.4065.5410.000	First Interstate Bank	TriState Lock coliseum door hardware	$	6.00
001.4066.5608.000	First Interstate Bank	HyVee Coliseum resale products	$	194.27
001.4066.5608.000	First Interstate Bank	HyVee Coliseum resale products	$	136.29
001.4066.5608.000	First Interstate Bank	Marshall BWS- coliseum even resale products	$	312.19
001.4066.5613.000	First Interstate Bank	Fareway- Coliseum resale products	$	100.71
001.4066.5613.000	First Interstate Bank	HyVee Coliseum resale products	$	62.36
001.6010.5600.000	First Interstate Bank	Amazon- promo items Keys to the City	$	56.79
001.6012.5465.000	First Interstate Bank	DoubleTree hotel - C Webb conference	$	964.41
001.6012.5605.000	First Interstate Bank	Amazon scissors - Carol	$	6.48
001.6012.5605.000	First Interstate Bank	Staples-binders (Carol)	$	6.45
001.6020.5210.000	First Interstate Bank	Column/ TR notifications	$	430.20
001.6020.5210.000	First Interstate Bank	Column/ TR notifications	$	292.98
001.6020.5605.000	First Interstate Bank	Staples-pens, paper	$	20.16
001.6021.5360.000	First Interstate Bank	USPS Finance postage	$	326.92

001.6021.5460.000	First Interstate Bank	GFOA online training - GAAP update for Acctg Mgr	$	135.00
001.6021.5605.000	First Interstate Bank	Amazon- keyboard stickers	$	5.11
001.6021.5605.000	First Interstate Bank	Amazon- envelope moisteners, receipt books	$	63.52
001.6021.5605.000	First Interstate Bank	Amazon- scanner roller kit	$	54.99
001.6021.5605.000	First Interstate Bank	Amazon monitor cleaning kits	$	20.78
001.6021.5702.000	First Interstate Bank	Finance- scanner for Accts Payable	$	339.99
001.6025.5605.000	First Interstate Bank	Amazon ethernet adapter	$	18.95
001.6025.5605.000	First Interstate Bank	Amazon flash drives, Tyvek envelopes	$	58.89
001.6050.5718.000	First Interstate Bank	Amazon Stanley shop vac	$	24.19
001.6050.5718.000	First Interstate Bank	Amazon cable tester, tracer kit	$	34.99
001.6051.5600.000	First Interstate Bank	Amazon papertowels	$	14.56
030.4010.5732.000	First Interstate Bank	juvenile books	$	253.76
030.4010.5732.000	First Interstate Bank	juvenile books	$	25.70
030.4010.5732.000	First Interstate Bank	spanish/welcome books	$	223.05
030.4010.5732.000	First Interstate Bank	juvenile books	$	8.54
030.4010.5732.000	First Interstate Bank	juvenile books	$	117.67
030.4010.5732.000	First Interstate Bank	juvenile books	$	48.30
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	8.69
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	29.32
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	16.23
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	7.49
030.4010.5732.000	First Interstate Bank	large-type books	$	10.91
030.4010.5732.000	First Interstate Bank	large-type books	$	25.23
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	21.96
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	25.47
030.4010.5732.000	First Interstate Bank	adult fiction books	$	88.30
030.4010.5732.000	First Interstate Bank	refund for unacceptable book	$	(8.69)
030.4010.5732.000	First Interstate Bank	refund for unacceptable book	$	(9.75)
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	17.99
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	7.99
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	15.98
030.4010.5732.000	First Interstate Bank	adult non-fiction books	$	20.00
030.4010.5732.000	First Interstate Bank	lost and replaced books	$	128.62
030.4010.5732.000	First Interstate Bank	adult fiction books	$	59.95
110.2010.5410.000	First Interstate Bank	Farmtek- white repair tape	$	12.78
110.2010.5450.000	First Interstate Bank	Street dept iPads	$	82.54
110.2010.5450.000	First Interstate Bank	Verizon Street and Sewer dept cell phones	$	51.84
110.2010.5565.000	First Interstate Bank	Hicklin Sports -oil change kit, gearcase oil	$	353.88
110.2010.5600.000	First Interstate Bank	Amazon - iron double bolt hose clamps	$	55.98
110.2010.5600.000	First Interstate Bank	Amazon - brass and ball valves	$	87.98
110.2010.5600.000	First Interstate Bank	Amazon - brass and ball valves	$	262.36
110.2010.5600.000	First Interstate Bank	Amazon - lug plug w/chain, fire house adapters	$	372.85
110.2010.5718.000	First Interstate Bank	Harbor Freight-pneumatic roller set, racing jack	$	282.98
110.2030.5410.000	First Interstate Bank	Amazon LED bulbs	$	135.22
110.2030.5718.000	First Interstate Bank	Amazon Stanley shop vac	$	24.19
110.2030.5718.000	First Interstate Bank	Amazon Torx screwdriver set	$	16.99
110.2040.5450.000	First Interstate Bank	electrical inspections	$	61.92
110.2040.5718.000	First Interstate Bank	Amazon Stanley shop vac	$	24.19
110.2040.5718.000	First Interstate Bank	Amazon Torx screwdriver set	$	16.99
110.2040.5718.000	First Interstate Bank	Amazon cable tester, tracer kit	$	34.99
110.2060.5450.000	First Interstate Bank	Engineering GIS	$	11.56
110.2060.5450.000	First Interstate Bank	Engineering GPS, JetPak, cell phones	$	172.38
110.2060.5605.000	First Interstate Bank	Amzon Engineering dept tape	$	11.33
140.4030.5450.000	First Interstate Bank	Mediacom internet	$	169.95
153.1010.5321.000	First Interstate Bank	K9 supplies - food	$	83.44
153.1010.5600.000	First Interstate Bank	KWIK Star - donated hospitality	$	5.16
153.1010.5600.000	First Interstate Bank	Supermarket Abarrotes- PD donated hospitality	$	58.85
154.1011.5718.000	First Interstate Bank	Amazon - PD weapon lights and key cabinet	$	2,135.34
154.1011.5718.000	First Interstate Bank	Brownells PD rifle cases, magazines, slings	$	1,776.31
170.4010.5450.000	First Interstate Bank	Hotspots for library	$	400.10
170.4010.5601.000	First Interstate Bank	Small Talk - books	$	202.20
170.4010.5732.000	First Interstate Bank	DVDs	$	68.61
170.4010.5732.000	First Interstate Bank	DVDs	$	27.99
170.4010.5732.000	First Interstate Bank	DVDs	$	10.39
170.4010.5732.000	First Interstate Bank	DVDs	$	36.19
170.4010.5732.000	First Interstate Bank	DVDs	$	22.00
170.4010.5732.000	First Interstate Bank	DVDs	$	(36.19)
170.4010.5732.000	First Interstate Bank	DVDs	$	21.48

170.4010.5734.000	First Interstate Bank	gift - memorial book	$	169.13
181.3040.5251.000	First Interstate Bank	DPH Regulatory program ram renewal 5/1/24-4/30/25	$	575.00
184.5030.5360.000	First Interstate Bank	USPS-Sect 8, Rental and Nuisance	$	100.00
184.5030.5360.000	First Interstate Bank	USPS Sect 8, Rental, Nuisance	$	100.00
184.5030.5360.000	First Interstate Bank	Endincia online postage fee	$	9.95
184.5030.5360.000	First Interstate Bank	USPS Sect 8, Rental and Nuisance postage	$	100.00
610.8015.5132.000	First Interstate Bank	Boot promotion credit	$	(15.00)
610.8015.5132.000	First Interstate Bank	Theisens WPCP employee clothing	$	321.89
610.8015.5132.000	First Interstate Bank	Browns shoes WPCP employee clothing	$	155.00
610.8015.5132.000	First Interstate Bank	Amazon WPCP employee clothing	$	59.99
610.8015.5251.000	First Interstate Bank	IA DNR - water use fee WPCP	$	126.50
610.8015.5251.000	First Interstate Bank	IA DNR Fee Grade 3 operator exam	$	32.29
610.8015.5280.000	First Interstate Bank	WEF membersip 11/1/24-10/31/25	$	160.00
610.8015.5344.000	First Interstate Bank	Controlled Access -monthly subscription	$	39.50
610.8015.5360.000	First Interstate Bank	USPS postage for lab shipments	$	11.55
610.8015.5410.000	First Interstate Bank	Farmtek- white repair tape	$	44.73
610.8015.5450.000	First Interstate Bank	WPCP cell services	$	104.84
610.8015.5450.000	First Interstate Bank	Mediacom WPCP internet for October	$	75.00
610.8015.5600.000	First Interstate Bank	Napa - oxygen sensor socket and extender	$	72.98
610.8015.5600.000	First Interstate Bank	Menards -WPCP Swiffer duster and batteries	$	24.89
610.8015.5600.000	First Interstate Bank	Menards - WPCP cleaning supplies	$	114.71
610.8015.5600.000	First Interstate Bank	Grainger pipe repair kits and hose	$	416.80
610.8015.5600.000	First Interstate Bank	Menards- gloves, epoxy putty, fiberweld repair	$	82.39
610.8015.5600.000	First Interstate Bank	Theisens - quick links	$	35.96
610.8015.5600.000	First Interstate Bank	Theisens chest waders WPCP	$	389.97
610.8015.5600.000	First Interstate Bank	Menards plumbing parts and supplies	$	66.62
610.8015.5600.000	First Interstate Bank	Theisens softerner salt and tape	$	394.94
610.8015.5603.000	First Interstate Bank	North Central Labs- glass fiber filters	$	611.20
610.8015.5603.000	First Interstate Bank	North Central Labs -500ml conductivity standard	$	29.70
610.8015.5603.000	First Interstate Bank	ERA trace metals analysis	$	201.51
610.8015.5605.000	First Interstate Bank	Staples - WPCP copy paper, pens, staples	$	55.75
610.8016.5132.000	First Interstate Bank	Amazon toner cartridges, wireless mouse, ear plugs	$	30.31
610.8016.5132.000	First Interstate Bank	Amazon safety vests	$	8.99
610.8016.5410.000	First Interstate Bank	Farmtek- white repair tape	$	19.17
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	Sanitary Sewer GIS	$	17.74
610.8016.5450.000	First Interstate Bank	Verizon Street and Sewer dept cell phones	$	25.00
610.8016.5600.000	First Interstate Bank	Amazon toner cartridges, wireless mouse, ear plugs	$	27.62
610.8016.5605.000	First Interstate Bank	Amazon- USB Hub splitter	$	11.99
610.8016.5605.000	First Interstate Bank	Amazon toner cartridges, wireless mouse, ear plugs	$	65.99
610.8016.5615.000	First Interstate Bank	Napa -generator battery-Marion Lift station	$	259.99
690.8050.5342.000	First Interstate Bank	Rosco- Monthly Transit GPS	$	252.00
690.8050.5565.000	First Interstate Bank	Amazon -battery tester	$	84.99
740.8065.5132.000	First Interstate Bank	Amazon toner cartridges, wireless mouse, ear plugs	$	20.20
740.8065.5132.000	First Interstate Bank	Amazon safety vests	$	6.00
740.8065.5410.000	First Interstate Bank	Farmtek- white repair tape	$	12.78
740.8065.5450.000	First Interstate Bank	Sewer dept GPS	$	16.51
740.8065.5450.000	First Interstate Bank	Storm Sewer GIS	$	11.97
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 dept cell phones	$	16.67
740.8065.5600.000	First Interstate Bank	Amazon toner cartridges, wireless mouse, ear plugs	$	18.42
740.8065.5605.000	First Interstate Bank	Amazon- USB Hub splitter	$	8.00
740.8065.5605.000	First Interstate Bank	Amazon toner cartridges, wireless mouse, ear plugs	$	43.99
750.8070.5344.000	First Interstate Bank	Controlled Access -monthly subscription	$	39.50
750.8070.5410.000	First Interstate Bank	Farmtek- white repair tape	$	6.39
999.1164.000	First Interstate Bank	Yard House- Hillers meal during training	$	4.75
999.1164.000	First Interstate Bank	KC Mariott Hillers/ Allen meal during training	$	1.00
999.1164.000	First Interstate Bank	Burger Kitchen Hillers/ Allen meal during training	$	1.73
999.1164.000	First Interstate Bank	Yard House- Hillers/ Allen meal during training	$	7.80
999.1164.000	First Interstate Bank	Walmart - Teske meal during training	$	7.89
999.1164.000	First Interstate Bank	Applebees- Teske meal during training	$	28.24
999.1164.000	First Interstate Bank	Walmart- Teske meal during training	$	20.93
999.1164.000	First Interstate Bank	Buffalo Wild Wings Teske meal during training	$	19.66
999.1164.000	First Interstate Bank	Walmart Teske meal during training	$	36.64
999.1164.000	First Interstate Bank	Olive Garden Teske meal during training	$	1.73
999.1164.000	First Interstate Bank	Applebees Teske meal during training	$	1.25
999.1164.000	First Interstate Bank	Walmart Teske meal during training	$	45.69

615.8015.5233.000	FOX Strand	WPC21001 WPCP Hdworks & Dig Const Phase 9/1-9/30	$	7,378.31
001.1010.5132.000	Galls Parent Holdings LLC	PD employee clothing	$	182.99
001.1010.5132.000	Galls Parent Holdings LLC	PD employee chevrons	$	64.41
001.1050.5132.000	Galls Parent Holdings LLC	Fire dept employee clothing	$	468.36
001.1050.5132.000	Galls Parent Holdings LLC	Fire dept job shirts	$	930.43
001.1050.5132.000	Galls Parent Holdings LLC	Fire dept employee clothing	$	133.00
364.2020.5342.000	GERVICH & SONS INC	Parking lot T Bollard for meter pedestal	$	160.00
001.4030.5215.000	Globalpayments	Park & Rec credit card fee	$	584.74
001.1010.5450.000	Granite Telecommunications LLC	Police line charges	$	195.63
001.1010.5450.000	Granite Telecommunications LLC	Police dept	$	301.91
001.1050.5450.000	Granite Telecommunications LLC	Line charges	$	71.14
001.1050.5450.000	Granite Telecommunications LLC	Fire dept	$	100.63
001.1070.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.1071.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.1075.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.4010.5450.000	Granite Telecommunications LLC	Library	$	133.63
001.4010.5450.000	Granite Telecommunications LLC	Line Charges	$	35.57
001.4030.5450.000	Granite Telecommunications LLC	Line charges	$	35.57
001.4040.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.4045.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.4065.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.4065.5450.000	Granite Telecommunications LLC	Colsieum	$	133.63
001.6010.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.6012.5450.000	Granite Telecommunications LLC	Land Lines	$	17.78
001.6020.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
001.6021.5450.000	Granite Telecommunications LLC	Line charges	$	71.21
001.6021.5450.000	Granite Telecommunications LLC	inside wire charge	$	1,312.00
001.6025.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
110.2010.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
110.2010.5450.000	Granite Telecommunications LLC	Street dept	$	66.81
110.2040.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
110.2060.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
181.3040.5450.000	Granite Telecommunications LLC	Line charges	$	35.57
184.5030.5450.000	Granite Telecommunications LLC	Line charges	$	17.78
610.8015.5450.000	Granite Telecommunications LLC	Line charges - WPCP	$	67.04
610.8015.5450.000	Granite Telecommunications LLC	Line charges	$	53.35
610.8016.5450.000	Granite Telecommunications LLC	Sewer dept	$	40.23
610.8016.5450.000	Granite Telecommunications LLC	Line charges	$	21.34
690.8050.5450.000	Granite Telecommunications LLC	Line chargs	$	17.78
690.8050.5450.000	Granite Telecommunications LLC	Transit dept	$	66.82
740.8065.5450.000	Granite Telecommunications LLC	Storm Water	$	26.82
740.8065.5450.000	Granite Telecommunications LLC	Line charges	$	14.23
750.8070.5450.000	Granite Telecommunications LLC	Line charages	$	17.78
184.5030.5242.000	Gray, Dennis	Rent assistance	$	490.00
001.1010.5475.000	Guy, Brian	Police Chief Assessment Center process	$	187.60
884.7010.5230.000	Health Partners	Monthly fees and premiums	$	12,274.08
884.7010.5230.000	Health Partners	retroactive credit	$	(5.82)
884.7010.5337.000	Health Partners	Monthly fees and premiums	$	28,503.37
884.7010.5339.000	Health Partners	Claims 9/12-9/18	$	50,729.52
884.7010.5339.000	Health Partners	Claims 9/12-9/18	$	3,360.67
884.7010.5339.000	Health Partners	Claims9/19-9/25	$	25,488.91
884.7010.5339.000	Health Partners	Claims 9/19-9/25	$	2,525.72
884.7010.5339.000	Health Partners	Claims 9/26-10/02	$	62,100.00
884.7010.5339.000	Health Partners	Claims 9/26-10/02	$	4,096.80
001.4010.5980.000	Hser, Doh Doh	returned lost book- replaces check to Jerry Hser	$	7.99
881.1050.5339.000	Hunter Lane LLC	Paid med claims 10/01-10/15	$	1,624.31
110.2010.5410.000	HydraQuip	Red Press Ram	$	505.00
110.2010.5410.000	HydraQuip	black grapple bucket cylinder	$	1,205.87
610.8015.5600.000	Hydro Dyne Engineering	WPCP replacement spray tips-prelim screens	$	483.57
001.4066.5613.000	HyVee Accounts Receivable	Coliseum resale products	$	12.27
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #303417	$	1,139.66
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	$	4,967.23
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
999.1131.000	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	$	134.32
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #705230	$	925.00
999.1131.000	ICMA 457-Mission Square Retirement	Mission Square Retirement - Plan #705230	$	965.00
999.1101.000	INTERNAL REVENUE SERVICE	Bi-Weekly Federal Taxes	$	28,367.25
999.1101.000	INTERNAL REVENUE SERVICE	Bi-Weekly Federal Taxes	$	16,031.66
999.1103.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Social Security	$	(54.88)
999.1103.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Social Security	$	5.28
999.1103.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Social Security	$	28,260.72
999.1103.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Social Security	$	6,250.78
999.1107.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Medicare	$	(12.84)
999.1107.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Medicare	$	1.24
999.1107.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Medicare	$	9,475.10
999.1107.000	INTERNAL REVENUE SERVICE	Bi-Weekly Payroll Medicare	$	4,790.82
184.5030.5342.000	IOWA DEPT OF INSPECTIONS & APPEALS	Section 8 investigations	$	809.78
001.1010.5600.000	Iowa Dept of Transportation	PD paper rolls for printer	$	106.20
001.1010.5600.000	Iowa Dept of Transportation	PD paper rolls for printer	$	424.80
001.4030.5410.000	Iowa Irrigation & Development	Echo Park repairs	$	385.88
110.2040.5230.000	IOWA ONE CALL	utility Div IA one call charges	$	24.30
610.8016.5230.000	IOWA ONE CALL	Sewer dept calls and emails	$	293.58
740.8065.5230.000	IOWA ONE CALL	Sewer dept calls and emails	$	195.72
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	(69.60)
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	37,524.74
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	265.89
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	7,614.06
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	6.68
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	37,275.35
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	Rounding	$	(0.07)
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	265.89
999.1106.000	IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM	PRIOR MONTH IPERS CONTRIBUTIONS	$	8,129.82
001.2080.5483.000	Iowa Regional Utilities Association	Airport water usage	$	172.54
001.6012.5192.000	Iowa Workforce Development	paid benefits	$	44.20
001.4030.5231.000	J & M Fabrication LLC	late fee	$	26.46
140.4030.5562.000	J & M Fabrication LLC	18 - 6ft posts for disc golf markers	$	1,764.00
610.8016.5412.000	Jetco Inc	E Main St lift station service call	$	645.00
001.1010.5565.000	Karl of Marshalltown	PD Dodge Durango repairs	$	190.38
110.2060.5565.000	Karl of Marshalltown	Engineering Dodge truck fuses	$	11.26
610.8016.5410.000	KB Excavating LLC	Hired For Sewer Repair 7-1/2 & 8 S 6th St	$	1,550.00
001.6050.5611.000	KRISS PREMIUM PRODUCTS INC	Boiler chemicals	$	359.51
001.1010.5359.000	LARRYS TOWING & TIRE SERVICE	PD vehicle towed	$	75.00
184.5030.5464.000	Larson, Geralyn	NAHRO Training meals	$	16.24
001.4010.5980.000	Laugerman, Deanna	returned lost DVD	$	10.99
001.4010.5386.000	LENZ, DUANE	Library contract mowings	$	495.00
001.1075.5359.000	LHogeland Auto Plaza LLC	code enforcement towing	$	220.00
001.1075.5359.000	LHogeland Auto Plaza LLC	code enforcement towing	$	220.00
001.1050.5347.000	Locality Media Inc	Fire Dept FirstDue Subcription-	$	16,702.88
110.2010.5565.000	LOGAN CONTRACTORS SUPPLY INC	Street truck 57 crack sealer	$	301.72
001.1010.5475.000	Logan, Jeremy	Police Chief Assessment Center Process	$	129.98
610.8016.5565.000	MACQUEEN EQUIPMENT	Sewer dept handle cap	$	162.58
740.8065.5565.000	MACQUEEN EQUIPMENT	Sewer dept handle cap	$	108.39
001.1010.5570.000	Marshall County Engineer	September gas purchases	$	6,553.06
001.1010.5570.000	Marshall County Engineer	September gas purchases	$	161.98
001.1050.5570.000	Marshall County Engineer	September gas purchases	$	177.59
001.1050.5571.000	Marshall County Engineer	September gas purchases	$	966.63
001.1071.5570.000	Marshall County Engineer	September gas purchases	$	47.20
001.1075.5570.000	Marshall County Engineer	September gas purchases	$	160.10
001.2020.5570.000	Marshall County Engineer	September gas purchases	$	44.10
001.4030.5570.000	Marshall County Engineer	September gas purchases	$	624.48
001.4030.5571.000	Marshall County Engineer	September gas purchases	$	246.19
001.6050.5570.000	Marshall County Engineer	September gas purchases	$	104.46
110.2010.5570.000	Marshall County Engineer	September gas purchases	$	721.15
110.2010.5570.000	Marshall County Engineer	September gas purchases	$	150.28
110.2010.5571.000	Marshall County Engineer	September gas purchases	$	1,547.01
110.2010.5571.000	Marshall County Engineer	September gas purchases	$	235.32
110.2040.5570.000	Marshall County Engineer	September gas purchases	$	198.72
110.2060.5570.000	Marshall County Engineer	September gas purchases	$	104.86
610.8015.5570.000	Marshall County Engineer	September gas purchases	$	214.44
610.8016.5570.000	Marshall County Engineer	September gas purchases	$	305.21
610.8016.5571.000	Marshall County Engineer	September gas purchases	$	492.94

690.8050.5570.000	Marshall County Engineer	September gas purchases	$	200.35
690.8050.5571.000	Marshall County Engineer	September gas purchases	$	4,433.59
740.8065.5570.000	Marshall County Engineer	September gas purchases	$	203.48
740.8065.5570.000	Marshall County Engineer	September gas purchases	$	144.60
740.8065.5571.000	Marshall County Engineer	September gas purchases	$	328.62
001.4030.5342.000	Marshall County Landfill	Parks construction debris	$	23.80
001.2090.5220.000	Marshalltown Water Works	landfill bills - July	$	251.90
610.8015.5220.000	Marshalltown Water Works	Sanitary Collections Costs - July	$	8,845.43
740.8065.5220.000	Marshalltown Water Works	Storm waterr Collection Services - July	$	625.35
110.2010.5620.000	Martin Marietta Materials	Street dept asphalt emulsion	$	292.08
001.1050.5410.000	MCATEE TIRE SALES & SERVICE INC	Fire dept RAM 1500 tires and services	$	858.95
001.1050.5413.000	MCATEE TIRE SALES & SERVICE INC	Fire dept RAM pickup tires	$	515.37
001.1010.5410.000	MENARDS	light bulbs, breaker, paper towels	$	11.89
001.4030.5611.000	MENARDS	Parks white marking flags and sharpies	$	28.91
001.4030.5611.000	MENARDS	Parks- hammer, torch kit, tape, electrical tester	$	312.17
001.4030.5611.000	MENARDS	Parks - U-bolts and sledge hammer	$	62.94
001.4030.5611.000	MENARDS	Parks acrylic sheets	$	11.22
001.4030.5611.000	MENARDS	Parks drill bit, chain saw tooth blade	$	80.88
001.4045.5611.000	MENARDS	Parks -Flex seal, liquid plumber, shims	$	20.55
110.2010.5132.000	MENARDS	Street dept gloves	$	21.99
110.2010.5600.000	MENARDS	crimped wire wheel bearings	$	4.47
110.2010.5718.000	MENARDS	2lb dead blow hammer, Digitial T-bevel	$	34.03
110.2030.5600.000	MENARDS	light bulbs, breaker, paper towels	$	4.99
140.4030.5410.000	MENARDS	Parks treated lumber	$	15.40
363.2010.5600.000	MENARDS	12 pk chip brushes	$	8.85
364.2020.5342.000	MENARDS	Parking lot T electrical conduit materials	$	32.41
364.2020.5342.000	MENARDS	Parking lot T materials for light pole & siren	$	18.27
364.2020.5342.000	MENARDS	Parking lot T conduit materials	$	14.90
364.2020.5342.000	MENARDS	Parking lot T returned materials	$	(14.90)
364.2020.5342.000	MENARDS	Parking lot T meter socket materials	$	13.62
364.2020.5342.000	MENARDS	light bulbs, breaker, paper towels	$	16.98
110.2030.5600.000	Michael Todd & Co Inc	marking paint for locates	$	87.82
110.2030.5600.000	Michael Todd & Co Inc	marking paint for locates	$	87.83
610.8015.5603.000	Microbac Laboratories Inc	LAB analysis digester #2	$	122.00
610.8015.5603.000	MIDLAND SCIENTIFIC INC	LAB phosphate modifier	$	308.17
610.8015.5603.000	MIDLAND SCIENTIFIC INC	LAB- solutions and reagents	$	434.08
610.8015.5603.000	MIDLAND SCIENTIFIC INC	LAB phosphate reagent & poly seed caps	$	397.54
610.8015.5603.000	MIDLAND SCIENTIFIC INC	LAB 5ml pipettes	$	88.95
110.2040.5410.000	MOBOTREX INC	Red LED traffic signal lightbulbs	$	472.00
001.1010.5464.000	Molitor, Jacob	Advanced De-escalation training meals	$	40.00
184.5030.5280.000	MRI Software LLC	Sect 8 occupant application review	$	8.00
184.5030.5280.000	MRI Software LLC	Section 8 occupant application reviews	$	16.00
184.5030.5347.000	MRI Software LLC	Section 8 Annual RHR Subsc 4/1/24-8/31/25	$	2,790.00
999.1105.000	MUNICIPAL FIRE & POLICE RETIREMENT	PRIOR MONTH MFPRSI CONTRIBUTIONS	$	31,599.91
999.1105.000	MUNICIPAL FIRE & POLICE RETIREMENT	PRIOR MONTH MFPRSI CONTRIBUTIONS	$	35,628.69
999.1105.000	MUNICIPAL FIRE & POLICE RETIREMENT	PRIOR MONTH MFPRSI CONTRIBUTIONS	$	31,623.93
999.1105.000	MUNICIPAL FIRE & POLICE RETIREMENT	PRIOR MONTH MFPRSI CONTRIBUTIONS	$	35,628.69
616.8016.5348.000	Municipal Pipe Tool Co	SAN21001 2020 Sanitary Sewer CIPP	$	95,539.32
001.1010.5359.000	Mustaines Towing & Recovery	PD tow from 12th Ave	$	363.00
001.4066.5613.000	NORTHERN LIGHTS DISTRIBUTING	Coliseum resale products	$	332.95
110.2010.5718.000	NORTHERN TOOL & EQUIPMENT CO	Street dept tool box	$	1,129.00
001.1010.5600.000	NUTRIEN AG SOLUTIONS INC	PD Windshield wash 55 gallons	$	185.00
001.2080.5571.000	NUTRIEN AG SOLUTIONS INC	Airport vehicles/ equipment diesel	$	750.40
999.1166.000	Patterson, Debra	Hold $40, County collected $100	$	60.00
Payroll	Payroll	Payroll 22	$	349,515.97
170.4010.5734.000	PENWORTHY COMPANY	Memorial books	$	294.90
030.4010.5732.000	Playaway Products LLC	juvenile audio books	$	59.84
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	Parks roll offs	$	256.16
001.4030.5342.000	Prairie Waste Solutions	Parks roll offs	$	256.16
001.4030.5342.000	Prairie Waste Solutions	Public Works Bldg 905 E Main	$	24.94
001.4030.5342.000	Prairie Waste Solutions	All Park Barrels	$	966.74
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
750.8070.5342.000	Prairie Waste Solutions	Woodland Dr Bullpen by Compost	$	99.75
001.4010.5344.000	PREMIER OFFICE EQUIPMENT	Library contract and copies	$	348.74
001.1010.5718.000	RACOM CORPORATION	PD V2 Jack, 2.5 mono tip shunt wired	$	37.75
610.8015.5460.000	RANSON, ROBERT T	meals not provided at conference	$	76.64
610.8015.5461.000	RANSON, ROBERT T	airline bag check	$	70.00
610.8015.5462.000	RANSON, ROBERT T	taxi fees	$	102.82
999.1131.000	RANSON, ROBERT T	ICMA liability refund	$	100.00
132.5020.5331.000	Region 6 Resource Partners	CDBG Downtown Facade Grant, 130 (final)	$	1,461.00
001.1010.5342.000	SCHENDEL PEST CONTROL INC	PD September pest control	$	50.52
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
001.4010.5342.000	SERVICEMASTER OF M'TOWN INC	October Library cleaning	$	1,934.00
001.1010.5370.000	Sho Biz Inc dba Minuteman	PD Vinyl banners	$	19.55
001.1050.5132.000	Sho Biz Inc dba Minuteman	Fire dept certificates	$	8.01
156.1050.5413.000	SIGN CREATIONS	FD Durango reflective vinyl signage	$	2,646.00
140.4030.5611.000	SMI Co	Parks safety fiber	$	1,761.00
140.4030.5611.000	SMI Co	Parks safety fiber	$	1,764.00
001.1010.5610.000	SUNSET LAW ENFORCEMENT	PD ammunition	$	1,337.80
001.1010.5472.000	Teske, Trey	Training mileage 9/16-10/18	$	366.75
110.2010.5132.000	THEISENS SUPPLY INC	Street dept high vis clothing	$	9.99
110.2010.5132.000	THEISENS SUPPLY INC	Street dept employee boots	$	194.99
110.2010.5600.000	THEISENS SUPPLY INC	hydraulic cylinder stop	$	33.29
110.2050.5600.000	THEISENS SUPPLY INC	wirelock pin for Brine trailer	$	1.69
610.8016.5132.000	THEISENS SUPPLY INC	Sewer dept employee clothing	$	80.98
610.8016.5600.000	THEISENS SUPPLY INC	Sewer dept sealant and gloves	$	23.73
740.8065.5132.000	THEISENS SUPPLY INC	Sewer dept employee clothing	$	53.99
740.8065.5600.000	THEISENS SUPPLY INC	Sewer dept sealant and gloves	$	15.82
999.1128.000	TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX HEALTH BENEFITS	$	5,111.90
999.1128.000	TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX HEALTH BENEFITS	$	833.29
999.1129.000	TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX DEP CARE BENEFITS	$	774.99
999.1129.000	TOTAL ADMINISTRATIVE SERVICE CORP.	FLEX DEP CARE BENEFITS	$	208.33
001.4040.5441.000	TREASURER ST OF IOWA	Sales/ Use tax	$	161.53
001.4040.5442.000	TREASURER ST OF IOWA	Sales/ Use tax	$	25.39
610.8015.5441.000	TREASURER ST OF IOWA	Sales/ Use tax	$	13,322.73
610.8015.5441.000	TREASURER ST OF IOWA	Sales/ Use tax	$	2,220.46
999.1102.000	TREASURER STATE OF IOWA	Bi-Weekly Payroll SIT	$	11,913.44
999.1102.000	TREASURER STATE OF IOWA	Bi-Weekly Payroll SIT	$	6,355.47
001.2020.5980.000	TREASURER, STATE OF IOWA	Harris, Jeremy 107089	$	25.00
001.2020.5980.000	TREASURER, STATE OF IOWA	Angstrom, Stephanie 105843	$	25.00
001.4010.5980.000	TREASURER, STATE OF IOWA	Armstrong, Alice 107181	$	11.99
001.4010.5980.000	TREASURER, STATE OF IOWA	Nunez, Rosa 106605	$	10.99
001.4010.5980.000	TREASURER, STATE OF IOWA	Ramirez-Sanchez, Gianna 107193	$	8.99
184.5030.5246.000	TREASURER, STATE OF IOWA	Rent assistance	$	3.00
184.5030.5246.000	TREASURER, STATE OF IOWA	Rent assistance	$	31.00
184.5030.5246.000	TREASURER, STATE OF IOWA	Rent assistance	$	30.00
184.5030.5246.000	TREASURER, STATE OF IOWA	Rent assistance	$	31.00
184.5030.5246.000	TREASURER, STATE OF IOWA	Rent assistance	$	27.00
184.5030.5246.000	TREASURER, STATE OF IOWA	Rent assistance	$	13.00
610.8015.5998.000	TREASURER, STATE OF IOWA	Chapman, Kris 106245	$	26.44
140.4030.5611.000	TRI STATE LOCK SERVICE	Parks service call and chamber	$	80.00
140.4030.5611.000	TRI STATE LOCK SERVICE	Parks service call and chamber	$	160.00
001.4010.5215.000	TSYS	Library credit card transaction fees	$	48.30
001.6021.5215.000	TSYS	Finance credit card transaction fees	$	127.23
200.7010.5830.000	UMB Bank NA	2020B Airport bond fees 10/1/2023-9/30/2024	$	600.00
200.7010.5830.000	UMB Bank NA	2020A Bond fees 10/1/23-9/30/24	$	390.00
200.7010.5830.000	UMB Bank NA	2020A Bond fees 10/1/23-9/30/24-Storm	$	210.00
999.1112.000	UNITED WAY	UNITED WAY	$	666.15
999.1112.000	UNITED WAY	UNITED WAY	$	24.00
999.1112.000	UNITED WAY	UNITED WAY	$	666.15
999.1112.000	UNITED WAY	UNITED WAY	$	24.00
341.5010.5609.000	Vajgrt, Roger	Post hole digger rental	$	65.00
001.4030.5980.000	Vargas, Rosa	Community bldg rental	$	185.00
001.1071.5450.000	VERIZON WIRELESS	Housing services	$	61.26
001.1075.5450.000	VERIZON WIRELESS	Housing services	$	61.26
610.8015.5600.000	WENDLING QUARRIES INC	rock for bio-solids app field entrance	$	1,658.11

001.4010.5482.000	WoodRiver Energy LLC	Library gas #7078	$	114.02
001.1099.5611.000	WW GRAINGER	Building HVAC filters	$	302.36
001.4010.5600.000	WW GRAINGER	Building HVAC filters	$	211.16
001.4030.5600.000	WW GRAINGER	Building HVAC filters	$	67.52
001.4065.5600.000	WW GRAINGER	Building HVAC filters	$	129.32
001.6050.5410.000	WW GRAINGER	Building HVAC filters 1/2 to YSS	$	59.00
001.4010.5344.000	Xerox Corp	Libraryt contract and copies	$	25.26
001.4030.5344.000	Ziegler Inc	PW Bldg generator annual services	$	142.20
001.6050.5344.000	Ziegler Inc	City Hall/ Cargenie Generator maintenance	$	2,176.00
001.6051.5344.000	Ziegler Inc	City Hall/ Cargenie Generator maintenance	$	2,176.00
110.2010.5344.000	Ziegler Inc	PW Bldg generator annual services	$	639.90
690.8050.5344.000	Ziegler Inc	PW Bldg generator annual services	$	639.90
TOTAL			**$**	**1,647,137.40**

MARSHALLTOWN
IOWA

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: Carol Web, City Administrator
Jill Petermeier, Human Resource Director

Re: Certified Hire List

Position: Police Chief

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

Chris Jones

This list is good for the current hiring only.

Date List Certified by Civil Service Commission: October 24, 2024

Nancy Harris

Nancy Harris, Civil Service Commission Chair

Attest:

Alicia Hunter

Alicia Hunter, Clerk of the Commission

the City of Marshalltown
POLICE DEPARTMENT

Joel Greer, Mayor
Carol Webb, City Administrator
Michael W. Tupper, Chief of Police
909 South 2nd Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5725
Fax - (641) 752-1211

TO: CIVIL SERVICE COMMISSION

FROM: MICHAEL W. TUPPER, CHIEF OF POLICE
CHRIS JONES, POLICE CAPTAIN

RE: CERTIFIED HIRE LIST

POSITION: POLICE OFFICER

AFTER REVIEWING ALL APPLICANTS AND THEIR QUALIFICATIONS, THE FOLLOWING PERSONS WERE TESTED, INTERVIEWED AND CONSIDERED TO BEST MEET THE QUALIFICATIONS FOR THE ABOVE LISTED POSITION AND ARE RANKED BY FINAL SCORE AS FOLLOWS;

LUKE HAGEMAN	77.67/151
BENJAMIN SAUDERS	77.34/151

*VETERANS PREFERENCE

THIS LIST WILL BE VALID FOR A PERIOD NOT TO EXCEED OCTOBER 24, 2025.

CERTIFIED BY CIVIL SERVICE COMMISSION ON THE 24TH DAY OF OCTOBER 2024.

Nancy Harris

NANCY HARRIS, CIVIL SERVICE COMMISSION CHAIR

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

the City of Marshalltown

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: Rick Legg, Street Superintendent
Heather Thomas, Public Works Director

Re: Street Mechanic New Hire List

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

Garrett Corn (262/357)
Angel Barrera (242/357)

*Veteran's Preference

This list shall be valid for a period not to exceed October 24, 2025

Certified by Civil Service Commission on October 24, 2024

Nancy Harris

Nancy Harris, Civil Service Commission Chair

Attest:

Alicia Hunter

Alicia Hunter, Clerk of the Commission

2024-225

RESOLUTION APPROVING CITY FEE SCHEDULE

WHEREAS, the City of Marshalltown has established various fees to cover the costs of issuing permits, inspections and other direct services; and

WHEREAS, the City Clerk has prepared an Exhibit of the updated fee schedule indicating the change; and

WHEREAS, these fees are authorized by law and are proposed to be established by the City of Marshalltown; and

WHEREAS, it is appropriate to review and confirm the fees.

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

Section 1. The fee change established as shown on the attached fee Exhibit is hereby approved.

Passed this 28th day of October 2024, and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

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

MARSHALLTOWN
IOWA

TO: Mayor and City Council
FROM: Alicia Hunter, City Clerk
DATE: October 24, 2024
RE: Master Fee Schedule Revision

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: Review city policies, procedures, plans, ordinances, programs, and services for updates and efficiencies.

Recommendation: Staff recommend approving the suggested fee changes.

Budget Impact:

Description/Background: City staff completed a review of collections for Chapter 72: Parking Rules and are required to remove the annual parking ticket fee.

The City Clerk has received multiple inquires about an annual license for peddlers/solicitors from new utility providers installing in Marshalltown. Staff would like to implement an annual licnese for new utility providers as they establish their service. It becomes time-intensive to issue daily licenses to all the contractors so the annual license is a preferred option for new utility providers. The annual fee is set at $200 which is the same as the Transient Merchant.

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

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Admin	Collections	Accounts Receivable - Admin Fee - Collection		Resolution	15.00		annual		
Admin	Collections	Assessments fee general		Resolution	45.00		per property tax assessment filing for unpaid property related charges		
Admin	Collections	Income/offset filing with the state (annual fee)		Resolution	15.00		per customer account processed for offset		
Admin	Collections	Parking tickets overdue (annual fee) per ticket		Resolution	5.00	-	per ticket	10/28/24	Remove fee, not allowed per Iowa Code
Admin	Collections	Returned Item Overdraft Fee (NSF)		Resolution	30.00				
Admin	FOIA	Non-routine requests		Resolution			see policy		
Admin	FOIA	Routine requests		Resolution			see policy		
Admin	Lease	Parking Spaces in City Lots - policy establishing lease	Rent	Resolution	25.00		$25 per month per space for no longer than 3 year terms		
Admin	Other	Alcohol >50% gross Sales	112.003	No Charge	-		food sales exceeding 60% gross sales allows minor in estab without parents		
Admin	Other	Animal Rescue League - Kennel and Disposition Chgs	90.052	Ordinance	-		ARL administers		
Admin	Permit	Cable Franchise Application Fee	114.002	Ordinance	100.00				
Admin	Permit	Cable Franchise Fee	114.002	Resolution	-		5% of revenue paid quarterly		
Admin	Permit	Carnivals	113.006	Resolution	100.00		$100 first day, $50 additional days		
Admin	Permit	Circuses Or menageries	113.002	Resolution	200.00		$200 per first day, $100 additional days		
Admin	Permit	Hauler - Garbage & Refuse	50.020 - 50.026	Resolution	100.00		Annual		
Admin	Permit	Hauler - Recycling	50.020 - 50.026	Resolution	25.00		Annual		
Admin	Permit	Hauler - Yard Waste	50.020 - 50.026	Resolution	15.00		Annual		
Admin	Permit	License Required to Carry on Business	110.002		-		varies -		
Admin	Permit	Liquor Licensing	State N/A	State	-		Annual - see state's schedule		
Admin	Permit	Secondhand Dealers, Itinerant Dealers, Pawnbrokers	117.004	Resolution	50.00		Annual		
Admin	Permit	Peddler or Solicitor (per person)	118.011	Resolution	10.00		Per day, per person		
Admin	Permit	Peddler or Solicitor - New Utility Provider	118.011	Resolution	-	200.00	Annual fee per person	10/28/24	
Admin	Permit	Tobacco/Nicotine/Vape	State N/A	State	100.00		Annual permit issued by city		
Admin	Permit	Transient Merchant - annual	118.011	Resolution	200.00		Annual		
Admin	Permit	Transient Merchant - annual (brick & mortar operation owner)	118.011	Resolution	25.00		Annual		
Admin	Permit	Transient Merchant - 24-hr license	118.011	Resolution	50.00		Operation on private or public property		
Admin	Permit	Vicious Animal	90.050	Resolution	15.00		Annual		
Airport	Rent	Rent - Airport Lights	Rent	Resolution	420.00		Airport 6-1-2024		
Airport	Rent	Rent - Aviation	Rent	Resolution	2,164.36		Airport 6-1-2024		
Airport	Rent	Rent - Aviation Svc fee	Rent	Resolution	50.00		Airport 6-1-2024		
Airport	Rent	Fixed-Base Operation Lease & Fuel Agreement	111.004	Resolution 2021-355	-		set by Management Contract		
Airport	Rent	Airport Services	111-004	Resolution	-		set by Management Contract		
Fire	Accident	Response Fee Non-Resident		Resolution	331.61		Hazmat fee sch - min 1 hr + materials		
Fire	Accident	Response Fee Resident		Resolution	Materials		Cost of materials; over 1 hr bill 15 min increments per HAZMAT sch		

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Fire	Accident	Spill pad	OTHER FEES		3.50				
Fire	Accident	Oil dry	OTHER FEES		12.00				
Fire	Accident	Vehicle Leaking Fluid		Resolution	Materials		Cost of materials; over 1 hr bill 15 min increments per HAZMAT sch		
Fire	HazMat	HazMat-Heavy Response Apparatus with 4 Personnel		Iowa Fire Service	357.14		per hour (minimum 1 hr, billed in 15 min increments after 1st hr)	12/12/22	
Fire	HazMat	HazMat-Light Response Apparatus with 2 Personnel		Iowa Fire Service	284.63		per hour (minimum 1 hr, billed in 15 min increments after 1st hr)	12/12/22	
Fire	HazMat	HazMat-Extra Response Personnel		Iowa Fire Service	27.53		per hour (minimum 1 hr, billed in 15 min increments after 1st hr)	12/12/22	
Fire	HazMat	HazMat-Expended Materials (replacement cost including shipping)		Iowa Fire Service	cost+		actual cost, labor and shipping		
Fire	HazMat	HazMat-Equipment Repair or Cleaning (cost plus labor including shipping)		Iowa Fire Service	cost+		actual cost, labor and shipping		
Fire	HazMat	HazMat-Damaged Equipment/Property (replacement/repair cost including shipping		Iowa Fire Service	cost+		actual cost, labor and shipping		
Fire	HazMat	HazMat-Other (Contracted services, contracted equip, evacuation of people, etc.)		Iowa Fire Service	Cost		Billed as used		
Fire	IllegalBurn	Illegal Burn - 1st Offense	91.026	Resolution	110.00				
Fire	IllegalBurn	Illegal Burn - 2nd Offense	91.026	Resolution	210.00				
Fire	IllegalBurn	Illegal Burn - 3rd Offense	91.026	Resolution	310.00				
Fire	IllegalBurn	Illegal Burn - Commercial Property	91.026	Resolution	Permit fee		Shall be charged the permit fee for violations		
Fire	IllegalBurn	Illegal Burn - Late Fee (past due 30 days)		Resolution	20.00		Violations will be assessed a late fee after 30 days	10/24/22	
Fire	Admin	Administrative Warrant - Building Inspection		Resolution	350.00		Fee to obtain administrative warrant when business is non-compliant in request for building inspection.	12/12/22	
Fire	Admin	Late Fee - Permits, inspections, fire code violations		Res 2024-001	20.00		Late fee assessed after 30 days past due	01/08/23	
Fire	Annual Permit	Aerosol Products	IFC 105.6.1	Ordinance	65.00				
Fire	Annual Permit	Amusement Buildings	IFC 105.6.2	Ordinance	65.00				
Fire	Annual Permit	Assembly <50 occupants	IFC 105.6.36	ordinance	40.00				
Fire	Annual Permit	Assembly 50-100 occupants	IFC 105.6.36	Ordinance	50.00				
Fire	Annual Permit	Assembly 101-300 occupants	IFC 105.6.36	Ordinance	70.00				
Fire	Annual Permit	Assembly 301-500 occupants	IFC 105.6.36	Ordinance	90.00				
Fire	Annual Permit	Assembly 501+ occupants	IFC 105.6.36	Ordinance	110.00				
Fire	Annual Permit	Aviation Facilities	IFC 105.6.3	Ordinance	70.00				
Fire	Annual Permit	Carbon Dioxide Systems	IFC 105.6.4	Ordinance	70.00				
Fire	Annual Permit	Carnivals & Fairs	IFC 105.6.5	Ordinance	70.00				
Fire	Annual Permit	Cellulose Nitrate Film or Storage	IFC 105.6.6	Ordinance	70.00				
Fire	Annual Permit	Combustible Dust Producing Ops	IFC 105.6.7	ordinance	70.00				
Fire	Annual Permit	Combustible Fiber Storage Permit	IFC 105.6.8	Ordinance	70.00				
Fire	Annual Permit	Compressed Gases	IFC 105.6.9	Ordinance	70.00				
Fire	Annual Permit	Commercial Burn Permit	91.021	Resolution	225.00				
Fire	Annual Permit	Confined Space Response	OTHER FEES	Resolution	2,500.00		annual beginning 7/1/2011, three years		
Fire	Annual Permit	Confined Space Permit- Lennox	OTHER FEES	Resolution	2,500.00		Annual		

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Fire	Annual Permit	Covered/Open Mall buildings	IFC 105.6.10	Ordinance	70.00				
Fire	Annual Permit	Cryogenic Fluids	IFC 105.6.11	Ordinance	70.00				
Fire	Annual Permit	Cutting/Welding	IFC 105.6.12	Ordinance	70.00				
Fire	Annual Permit	Dry Cleaning	IFC 105.6.13	Ordinance	70.00				
Fire	Annual Permit	Exhibits/Trade Shows	IFC 105.6.14	Ordinance	70.00				
Fire	Annual Permit	Explosives/Fireworks	IFC 105.6.15	Ordinance	85.00				
Fire	Annual Permit	Fire Excessive Alarm (6-9)	32.003	Ordinance	65.00		First 5 free, fee per alarm		
Fire	Annual Permit	Fire Excessive Alarm (10-14)	32.003	Ordinance	90.00		First 5 free, fee per alarm		
Fire	Annual Permit	Fire Excessive Alarm (15+)	32.003	Ordinance	115.00		First 5 free, fee per alarm		
Fire	Annual Permit	Fire Hydrants/Valves	IFC 105.6.16	Ordinance	70.00				
Fire	Annual Permit	Flammable/Combustible Liquids <1000 gal	IFC 105.6.17	Ordinance	70.00				
Fire	Annual Permit	Flammable/Combustible Liquids 1001-10,000 gal	IFC 105.6.17	Ordinance	90.00				
Fire	Annual Permit	Flammable/Combustible Liquids >10,001 gal	IFC 105.6.17	Ordinance	115.00				
Fire	Annual Permit	Floor Finishing >350 sq ft using class 1/2 liquids	IFC 105.6.18	Ordinance	70.00				
Fire	Annual Permit	Fruit/Crop Ripening	IFC 105.6.19	Ordinance	70.00				
Fire	Annual Permit	Fumigation/Insecticide Fogging	IFC 105.6.20	Ordinance	70.00				
Fire	Annual Permit	Hazardous Materials	IFC 105.6.21	Ordinance	80.00				
Fire	Annual Permit	HPM Facilities-Use/Storage (Hazardous Production Materials	IFC 105.6.22	Ordinance	70.00				
Fire	Annual Permit	High-Piles Storage	IFC 105.6.23	Ordinance	70.00				
Fire	Annual Permit	Hot Work Operations	IFC 105.6.24	Ordinance	70.00				
Fire	Annual Permit	Industrial Ovens	IFC 105.6.25	Ordinance	70.00				
Fire	Annual Permit	Liquid/Gas-Fueled Equipment in Assembly	IFC 105.6.27		70.00				
Fire	Annual Permit	LP Gas/Use/Storage/Dispensing <5,000 gal	IFC 105.6.28	Ordinance	70.00				
Fire	Annual Permit	LP Gas/Use/Storage/Dispensing 5-10,000 gal	IFC 105.6.28	Ordinance	90.00				
Fire	Annual Permit	LP Gas/Use/Storage/Dispensing 10,000+ gal	IFC 105.6.28	Ordinance	115.00				
Fire	Annual Permit	Lumber yard/Woodworking Plants	IFC 105.6.26	Ordinance	70.00				
Fire	Annual Permit	Magnesium Use	IFC 105.6.29	Ordinance	70.00				
Fire	Annual Permit	Misc Combustible Storage	IFC 105.6.30	Ordinance	70.00				
Fire	Annual Permit	Motor Fuel Dispensing Facilities 1-1,000 gal	IFC 105.6.31	Ordinance	70.00				
Fire	Annual Permit	Motor Fuel Dispensing Facilities 1,001-10,000 gal	IFC 105.6.31	Ordinance	90.00				
Fire	Annual Permit	Motor Fuel Dispensing Facilities 10,001+ gal	IFC 105.6.31	Ordinance	115.00				
Fire	Annual Permit	Open Flames & Torches	IFC 105.6.33	Ordinance	70.00				
Fire	Annual Permit	Open Flames & Candles	IFC 105.6.34	Ordinance	70.00				
Fire	Annual Permit	Organic Coatings	IFC 105.6.35	Ordinance	70.00				

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Fire	Annual Permit	Pyrotechniques/Special Effects	IFC 105.6.38	Ordinance	265.00				
Fire	Annual Permit	Pyroxylin Plastics >25# storage, assembly, manufacturing	IFC 105.6.39	Ordinance	70.00				
Fire	Annual Permit	Refrigeration Equipment/Commercial	IFC 105.6.40	Ordinance	70.00				
Fire	Annual Permit	Repair Garages/Fuel Dispensing Facilities	IFC 105.6.41	Ordinance	70.00				
Fire	Annual Permit	Rooftop Heliports	IFC 105.6.42	Ordinance	70.00				
Fire	Annual Permit	Spraying and Dipping	IFC 105.6.43	Ordinance	70.00				
Fire	Annual Permit	Scrap Tire Storage	IFC105.6.44	Ordinance	70.00				
Fire	Annual Permit	Temporary Membrane/Tent Structures	IFC 105.6.45	Ordinance	70.00				
Fire	Annual Permit	Tire Rebuilding Plants	IFC 105.6.46	Ordinance	70.00				
Fire	Annual Permit	Waste Handling - wrecking & junk yards, waste handling facilities	IFC 105.6.47	Ordinance	70.00				
Fire	Annual Permit	Liquor License/Mercantile Inspection		Resolution	70.00				
Fire	PlanReview	Plan Review - Alarm System		Resolution	110.00		*does not include 3rd party reviewer charges for factory, hazardous, educational, institutional, storage occupancy		
Fire	PlanReview	Plan Review - Building		Resolution	110.00				
Fire	PlanReview	Plan Review - Sprinkler System		Resolution	110.00				
Fire	Biennial Permit	Commercial Space 1,500 or less sq/ft (initial)		Resolution	50.00			12/27/22	
Fire	Biennial Permit	Commercial Space 1,500 or less sq/ft (Reinspection)		Resolution	50.00			12/27/22	
Fire	Biennial Permit	Commercial Space 1,501-3,000 sq/ft (initial)		Resolution	100.00				
Fire	Biennial Permit	Commercial Space 1,501-3,000 sq/ft (Reinspection)		Resolution	100.00				
Fire	Biennial Permit	Commercial Space 3,001-6,000 sq/ft (initial)		Resolution	200.00				
Fire	Biennial Permit	Commercial Space 3,001-6,000 sq/ft (Reinspection)		Resolution	200.00				
Fire	Biennial Permit	Commercial Space 6,001-9,000 sq/ft (initial)		Resolution	300.00				
Fire	Biennial Permit	Commercial Space 6,001-9,000 sq/ft (Reinspection)		Resolution	300.00				
Fire	Biennial Permit	Commercial Space 9,001-12,000 sq/ft (initial)		Resolution	400.00				
Fire	Biennial Permit	Commercial Space 9,001-12,000 sq/ft (Reinspection)		Resolution	400.00				
Fire	Biennial Permit	Commercial Space 12,001-15,000 sq/ft (initial)		Resolution	500.00			12/27/22	
Fire	Biennial Permit	Commercial Space 12,001-15,000 sq/ft (Reinspection)		Resolution	500.00			12/27/22	
Fire	Biennial Permit	Commercial Space 15,001 or more sq/ft (initial)		Resolution	600.00			12/27/22	
Fire	Biennial Permit	Commercial Space 15,001 or more sq/ft (Reinspection)		Resolution	600.00			12/27/22	
Housing	Building	Backflow Prevention	153.002	Ordinance	10.00		Per (C), (b), 4_Annual Renewal Fee - Collected by Marshalltown Water Works		
Housing	Building	Building Investigation Fee		Resolution	-				
Housing	Building	Building Permit	Current Schedule	Resolution	-		Intl Code Council Building Valuation Data Table & Schedule		
Housing	Building	Solar: Single-Family Residential (Solar Base: simple plan review & 2 inspection trips, admin fee)	154.058	Resolution	95.00			12/12/22	
Housing	Building	Trade Permit (Plumbing, Mechanical & Electrical) - Residential - New home construction		Resolution	125.00			12/12/22	
Housing	Building	Trade Permit (Plumbing, Mechanical & Electrical) - Residential - Alteration		Resolution	85.00			12/12/22	

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Housing	Building	Trade Permit (Plumbing, Mechanical & Electrical) - Residential - Minor equipment/appliance replacement		Resolution	62.00			12/12/22	
Housing	Building	Trade Permit (Plumbing, Mechanical & Electrical) - Commercial (inc. all uses other than single-family)		Resolution	Valuation		$50 for first $1,000 then $5 for each additional $1,000 valuation	12/12/22	
Housing	Building	Demolition Permit - Residential		Resolution	50.00		Each building		
Housing	Building	Demolition Permit - Commercial		Resolution	100.00		Each building		
Housing	Building	Plan Review Fees	151.002		Valuation		Based on 65% of building permit valuation schedule for projects with valuation over $500,000	12/12/22	
Housing	Code Enf	Certified Mail Fee		Ordinance	cost		recoup actual cost for nuisance cleanup		
Housing	Code Enf	Code Enforcement Admin Fee		Resolution	100.00		per cleanup		
Housing	Code Enf	Landfill Fee - Nuisance		Ordinance	cost		recoup actual cost for nuisance cleanup		
Housing	Code Enf	Nuisance Abatement Cleanup Fee		Ordinance	cost		recoup actual cost for nuisance cleanup		
Housing	Code Enf	Nuisance Vehicle - Impound Fee	95.009	Resolution	cost		reasonable fee for less than 14 days storage		
Housing	Code Enf	Towing Fee - Nuisance charges		Ordinance	cost		recoup actual cost for nuisance cleanup		
Housing	Code Enf	Vacant Property Code Registration		Resolution	100.00		Annual Registration		
Housing	Code Enf	Vacant Property Code Uninsured Property Fee		Resolution	3,000.00				
Housing	Lead Program	Lead hazard Control Grant Program Subordination		Resolution	100.00				
Housing	Rental	Application Fee - new rental properties (unoccupied)		Resolution	50.00				
Housing	Rental	Application Fee - new rental properties (occupied)		Resolution	500.00				
Housing	Rental	Assessment fee - rental housing	152.005	Resolution	25.00		per parcel item assessed to taxes		
Housing	Rental	Complaint - Housing Advisory Board	152.008	Resolution	-		Per instance $100 deposit		
Housing	Rental	No-Show Fee for Rental Property Inspection - City Staff Inspection		Resolution	50.00		No-show or failure to provide 24-hr cancellation	02/27/23	
Housing	Rental	No-Show Fee for Rental Property Inspection - Contracted Inspection	2024-138	Resolution	Cost		No-show or failure to provide 48-hr cancellation	07/01/24	
Housing	Rental	Rental Property Inspection - 1st Unit per Parcel	152.004	Resolution & Service Agreement	90.00		Per rental unit inspection per parcel	12/12/22	
Housing	Rental	Rental Property Inspection - 2nd Unit per Parcel	152.004	Resolution & Service Agreement	50.00		Per rental unit inspection per parcel	12/12/22	
Housing	Rental	Rental Property Inspection -3rd-15th Unit per Parcel	152.004	Resolution & Service Agreement	20.00		Per rental unit inspection per parcel	12/12/22	
Housing	Rental	Rental Property Inspection -16 Units and above per Parcel	152.004	Resolution & Service Agreement	400.00		Max fee for large complex per parcel	12/12/22	
Housing	Rental	Rental Property Registration - Annual Fee	152.004	Resolution	15.00		Per rental unit/annual fee	12/12/22	
Housing	Zoning	Annexation - Voluntary for non taxable property		Resolution	250.00				
Housing	Zoning	Final Subdivision Plat		Resolution	100 + 50/ac.				
Housing	Zoning	Home Occupation Special Use Permit		Resolution	50.00				
Housing	Zoning	Home Occupation Special Use Permit		Resolution	150.00				
Housing	Zoning	Ordinance change request		Resolution	500.00				
Housing	Zoning	Planned Unit Development Amendment (no requiring hearings)		Resolution	200.00				
Housing	Zoning	Planned Unit Development Amendment (requiring hearings)		Resolution	500.00				
Housing	Zoning	Planned Unit Development base fee		Resolution	300 + 50/ac		$300 base fee plus $50 per acre		

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Housing	Zoning	Rezoning Request		Resolution	500.00				
Housing	Zoning	Severance Fee		Resolution	250.00				
Housing	Zoning	Sidewalk Deferment Application	57.039	Resolution	250.00				
Housing	Zoning	Sign Permit		Resolution	50.00				
Housing	Zoning	Special Use Permit		Resolution	300.00				
Housing	Zoning	Subdivision Final Plat base fee		Resolution	100.00				
Housing	Zoning	Subdivision Final Plat per acre fee		Resolution	50.00				
Housing	Zoning	Subdivision Preliminary Plat Base fee		Resolution	250.00				
Housing	Zoning	Subdivision Preliminary Plat per acre fee		Resolution	50.00				
Housing	Zoning	Variance - any other building		Resolution	200.00				
Housing	Zoning	Variance - owner occupied dwelling		Resolution	150.00				
Housing	Zoning	Zoning Verification Letter (Multi-family, Commercial, Industrial, Non-SF)		Resolution	100.00				
Housing	Zoning	Zoning Verification Letter (Single Family Residential)		Resolution	25.00				
Park & Rec	Aquatic	Adult/Tot Swim (T,Th, Sat) 15-pass scan card		Resolution	40.00				
Park & Rec	Aquatic	Adult/Tot Swim (T,Th, Sat) daily		Resolution	3.00				
Park & Rec	Aquatic	Aquatic center admission - 10-tickets sheet		Resolution	45.00				
Park & Rec	Aquatic	Aquatic center admission - after 5 pm		Resolution	3.00				
Park & Rec	Aquatic	Aquatic center admission - daily		Resolution	5.00				
Park & Rec	Aquatic	Birthday Splash - 10 plus hot dog and drink		Resolution	50.00				
Park & Rec	Aquatic	Birthday Splash - 10 plus pizza and drink		Resolution	60.00				
Park & Rec	Aquatic	Birthday Splash - 10 plus small drink		Resolution	70.00				
Park & Rec	Aquatic	Doggie Dip (per dog)		Resolution	5.00				
Park & Rec	Aquatic	Rental - Entire aquatic center	2024-138	Resolution	1,000.00		2-hour private rental	07/01/24	
Park & Rec	Aquatic	Season Pass - 1-person		Resolution	110.00				
Park & Rec	Aquatic	Season Pass - 2-person family		Resolution	180.00				
Park & Rec	Aquatic	Season Pass - additional family members		Resolution	30.00				
Park & Rec	Aquatic	Season Pass - nanny		Resolution	95.00				
Park & Rec	Aquatic	Splash Dance		Resolution	3.00				
Park & Rec	Aquatic	Swimming Lesson- indoor learn to swim		Resolution	45.00			02/13/23	
Park & Rec	Aquatic	Swimming Lesson- indoor preschool		Resolution	45.00			02/13/23	
Park & Rec	Aquatic	Swimming Lesson- outdoor learn to swim		Resolution	45.00			02/13/23	
Park & Rec	Aquatic	Swimming Lesson- outdoor preschool		Resolution	40.00			02/13/23	
Park & Rec	Aquatic	Water walking / lap swim - 15-pass scan card		Resolution	40.00				
Park & Rec	Aquatic	Water walking / lap swim - daily		Resolution	3.00				

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Park & Rec	Campground	Camping - Electric only	93.001	Resolution	25.00		per day	02/13/23	
Park & Rec	Campground	Camping - Full Hookup	93.001	Resolution	30.00		per day	02/13/23	
Park & Rec	Campground	Camping - no electric	93.001	Resolution	20.00		per day	02/13/23	
Park & Rec	Dog Park	Dog Park Pass-Intact Animal		Resolution	30.00		ANNUAL	02/13/23	
Park & Rec	Dog Park	Dog Park Pass-Spayed or Neutered Animal		Resolution	25.00		ANNUAL	02/13/23	
Park & Rec	Memorial	Memorial Bench		Resolution	2,000.00		Includes installation on concrete pad		
Park & Rec	Memorial	Memorial Plaque		Resolution	100.00				
Park & Rec	Memorial	Memorial Tree		Resolution	400.00				
Park & Rec	Rental	Ice Skate Rental		Res 2024-001	2.00			01/08/24	
Park & Rec	Rental	Unreturned Ice Skate Rental		Res 2024-001	50.00		Charged to credit card on file	01/08/24	
Park & Rec	Shelter	Adding Alcohol to Rental		Resolution	30.00		Daily Rate		
Park & Rec	Shelter	Shelter - Anson (seasonal)		Resolution	100.00		Daily Rate	02/13/23	
Park & Rec	Shelter	Shelter - Riverview Community Bldg		Resolution	175.00		Daily Rate	02/13/23	
Park & Rec	Shelter	Shelter - Kiwanis (seasonal)		Resolution	90.00		Daily Rate	02/13/23	
Park & Rec	Shelter	Shelter - Riverview Log Cabin (seasonal)		Resolution	50.00		Daily Rate	02/13/23	
Park & Rec	Shelter	Shelter - Riverview Reunion Hall		Resolution	150.00		Daily Rate	02/13/23	
Park & Rec	Terrace	Tree Planting- terrace		Resolution	-		None issued - moratorium		
Park & Rec	VMC	Recreational Activities, Programs, Classes			varies		Varies by session		
Park & Rec	VMC	SUMMER BLAST (day camp)			115.00		per child per week	02/13/23	
Park & Rec	VMC	Half Gym - 1 court (hourly/weekday)		Res 2020-360	25.00		Hourly/weekday		
Park & Rec	VMC	Half Gym - 1 court (all day/weekday)		Res 2020-360	300.00		Allday/weekday		
Park & Rec	VMC	Half Gym - 1 court (hourly/weekend)		Res 2020-360	50.00		Hourly/weekend		
Park & Rec	VMC	Half Gym - 1 court (hourly/weekend)		Res 2020-360	400.00		Allday/weekend		
Park & Rec	VMC	Whole Gym (hourly/weekday)		Res 2020-360	50.00		Hourly/weekday		
Park & Rec	VMC	Whole Gym (all day/weekday)		Res 2020-360	600.00		Allday/weekday		
Park & Rec	VMC	Whole Gym (hourly/weekend)		Res 2020-360	100.00		Hourly/weekend		
Park & Rec	VMC	Whole Gym (hourly/weekend)		Res 2020-360	800.00		Allday/weekend		
Park & Rec	VMC	Flex Rooms (hourly/weekday)		Res 2020-360	25.00		Hourly/weekday		
Park & Rec	VMC	Flex Rooms (all day/weekday)		Res 2020-360	300.00		Allday/weekday		
Park & Rec	VMC	Flex Rooms (hourly/weekend)		Res 2020-360	50.00		Hourly/weekend		
Park & Rec	VMC	Flex Rooms (hourly/weekend)		Res 2020-360	400.00		Allday/weekend		
Park & Rec	VMC	Multi-Room Discount (hourly/weekday)		Res 2020-360	5.00		Hourly/weekday		
Park & Rec	VMC	Multi-Room Discount (all day/weekday)		Res 2020-360	50.00		Allday/weekday		
Park & Rec	VMC	Multi-Room Discount (hourly/weekend)		Res 2020-360	5.00		Hourly/weekend		

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Park & Rec	VMC	Multi-Room Discount (hourly/weekend)		Res 2020-360	50.00		Allday/weekend		
Park & Rec	VMC	Conference Room (hourly/weekday)	*Free to non-profit/service clubs, M-F 7am-5pm	Res 2020-360	25.00		Hourly/weekday		
Park & Rec	VMC	Conference Room (all day/weekday)	*Free to non-profit/service clubs, M-F 7am-5pm	Res 2020-360	300.00		Allday/weekday		
Park & Rec	VMC	Conference Room(hourly/weekend)	*Free to non-profit/service clubs, M-F 7am-5pm	Res 2020-360	50.00		Hourly/weekend		
Park & Rec	VMC	Conference Room (hourly/weekend)	*Free to non-profit/service clubs, M-F 7am-5pm	Res 2020-360	400.00		Allday/weekend		
Park & Rec	VMC	Daily Drop-in Fee (Adults)		Res 2020-360	3.00		per hr		
Park & Rec	VMC	Bounce House		Res 2020-360	75.00		for 2 hours		
Park & Rec	VMC	Tournament Fee		Res 2020-360	200.00		Day		
Park & Rec	VMC	Large Event Fee (Setup, tear down, Fri setup, Sun cleanup)		Res 2020-360	600.00		per event		
Park & Rec	VMC	Deposit for all day events, large events, tournaments		Res 2020-360	500.00				
Police	Alarm	Alarm- failure to notify PD of service changes	33.024	Resolution	-				
Police	Alarm	Alarm Police - Failure to Notify PD Service Fee	33-024	Ordinance	25.00				
Police	Alarm	Alarm Police - False	33.022	Resolution	40.00		First two in calendar year are free		
Police	Alarm	Malfunctioning Alarm - Service fee to disable	33.023		-				
Police	Noise Control	Noise Permit for 24 hours or less	134.006	Ordinance	25.00		Each		
Police	Noise Control	Noise Permit for one to seven days	134.006	Ordinance	40.00		Each date		
Police	Operations	Social Host Ordinance Enforcement fee	112.040	Ordinance	cost		Officers time on investigation		
Police	Operations	X-duty Police Security Services		Resolution	80.00		per hour		
Police	Operations	Towing Admin Fee		Ordinance	50.00				
Police	Parking	Parking - impounded pursuant to 72.071			50.00				
Police	Parking	Parking Violations	72.001	Ordinance	20.00		per ticket		
Police	Parking	Parking Violations - Over 30 days	72.001	Ordinance	5.00		per ticket		
Police	Parking	Parking Ticket - multiple offenses and charges	72.001, 72-002, 72.003 - 72.999	Ordinance	varies				
Police	Parking	Skof Tow Fee	72.070 - 72.0076		50.00				
Police	Records	Copying of Public Records		Resolution	-		Actual cost for providing digital media		
Police	Records	Copying of Public Records		Resolution	0.25		per page		
Police	Records	Copying of Public Records		Resolution	1.00		per DVD/CD		
Police	Records	Fingerprinting services		Resolution	20.00		No card limit, waive fee for MCSD staff		
Police	Records	Local Criminal History		Resolution	13.00				
Public Works	Compost	Yard Waste and tree Debris Disposal - Kraft bag disposal	50.006	Resolution	1.00				
Public Works	Compost	Yard Waste and tree Debris Disposal - Resusable Container	50.006	Resolution	3.00		minimum		
Public Works	Compost	Yard Waste and tree Debris Disposal - Car/Van/SUV	50.006	Resolution	6.00				
Public Works	Compost	Yard Waste and tree Debris Disposal - Pickup Truck Under 8' bed length	50.006	Resolution	15.00			08/08/22	
Public Works	Compost	Yard Waste and tree Debris Disposal - Pickup Truck 8' and over bed length	50.006	Resolution	20.00			08/08/22	

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Public Works	Compost	Yard Waste and tree Debris Disposal - Dump Truck Small (1 ton)	50.006	Resolution	30.00				
Public Works	Compost	Yard Waste and tree Debris Disposal - Dump Truck Medium (single axle)	50.006	Resolution	65.00			08/08/22	
Public Works	Compost	Yard Waste and tree Debris Disposal - Dump Truck Large (tandem axle)	50.006	Resolution	115.00			08/08/22	
Public Works	Compost	Yard Waste and tree Debris Disposal - Semi-Truck & Trailer	50.006	Resolution	200.00			08/08/22	
Public Works	Compost	Yard Waste and tree Debris Disposal - Trailer Under 8' long	50.006	Res 2024-138	15.00			07/01/24	
Public Works	Compost	Yard Waste and tree Debris Disposal - Trailer 8' to 10' long	50.006	Resolution	40.00			08/08/22	
Public Works	Compost	Yard Waste and tree Debris Disposal - Trailer Over 10' long (with sides <18")	50.006	Resolution	60.00			08/08/22	
Public Works	Compost	Yard Waste and tree Debris Disposal - Trailer Over 10' long (with sides >/=18")	50.006	Resolution	105.00			08/08/22	
Public Works	Compost	Loading Fee - Compost or Mulch/Wood Chips	50.006	Resolution	20.00				
Public Works	Compost	Sale of Compost - 5-Gallon Bucket	50.006	Res 2024-055	2.00			03/25/24	
Public Works	Compost	Sale of Compost - Reusable Container (Trash Can)	50.006	Res 2024-055	10.00			03/25/24	
Public Works	Compost	Sale of Compost - Pickup Truck Bed	50.006	Res 2024-055	50.00			03/25/24	
Public Works	Compost	Sale of Compost - Per City End Loader Bucket (Scoop)	50.006	Res 2024-055	60.00			03/25/24	
Public Works	Compost	Unprocessed firewood & mulch available on a first come basis (loading fee applies)	50.006	Resolution	-			08/08/22	
Public Works	Compost	Access fee to compost in off season		Resolution	500.00				
Public Works	Electrical	Electrical Contractor License	154.085 - renewal 154.088	Ordinance	100.00		Annual, expires 12/31		
Public Works	Electrical	Electrical work by homeowner	154.058	Resolution	-		Annual, expires 12/31		
Public Works	Electrical	Journeyman Electric License	154.085 - renewal 154.088	Ordinance	30.00		Annual, expires 12/31		
Public Works	Electrical	Electrical Vehicle Charging Station - Energy Cost	N/A	Resolution	0.364		per kWh while charging w/ free parking	07/01/23	
Public Works	Electrical	Electrical Vehicle Charging Station - Parking Cost (after 1 hr grace period after charging stops)	N/A	Resolution	5.00		per hour	10/24/22	
Public Works	Electrical	Electrical Connection_13th St District Street Lights_Public Use Permit Per Day Per 15 Amp Duplex Receptacle	N/A	Resolution	50.00		per day, per duplex receptable location	07/24/23	
Public Works	Engineering	Driveway Approach Inspection	72.039	Resolution	36.00		EACH	07/01/23	
Public Works	Engineering	Driveway Permit Application	72.039	Resolution	36.00		EACH	07/01/23	
Public Works	Engineering	Driveway Approach Re-Inspection Fee	72.039	Resolution	28.00		EACH	07/01/23	
Public Works	Engineering	Driveway Extension	72-039	Resolution	49.00		EACH	07/01/23	
Public Works	Engineering	Entrance/Curb Cut	57.016	Resolution	27.00		EACH	07/01/23	
Public Works	Engineering	Bond - Annual	57.023	Resolution	10,000.00				
Public Works	Engineering	Bond - Site Specific	57.023	Resolution	1,000.00			07/01/24	
Public Works	Engineering	Excavation Permit (Work within the ROW)	57.021	Resolution	23.00		EACH		
Public Works	Engineering	Excavation Permit - Longitudinal Utility (for utilities with city franchise agreements)		Resolution	25.00		Per Block (maximum block length of 450 feet)	01/23/23	
Public Works	Engineering	Excavation Permit - Longitudinal Utility (for utilities without city franchise agreements)		Resolution	100.00		Per Block (maximum block length of 450 feet)	01/23/23	
Public Works	Engineering	Failure to Obtain Permit Before Starting Work (1st Offense)		Res 2024-138	-		Warning (one per calendar year)	07/01/24	
Public Works	Engineering	Failure to Obtain Permit Before Starting Work (2nd Offense)		Res 2024-138	100.00		Each per calendar year	07/01/24	
Public Works	Engineering	Failure to Obtain Permit Before Starting Work (3rd Offense)		Res 2024-138	250.00		Each per calendar year	07/01/24	

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Public Works	Engineering	Failure to Obtain Permit Before Starting Work (4th or Subsequent Offense)		Res 2024-138	500.00		Each per calendar year	07/01/24	
Public Works	Engineering	Mailbox - max reimbursement for city-damaged post	59.007 - 59.008	Resolution	75.00		max reimb for replacement	07/01/23	
Public Works	Engineering	Moving Building		Resolution	50.00		Each Building		
Public Works	Engineering	Moving Building (loads exceeding vehicle weight limits)		Resolution	200.00		Each building		
Public Works	Engineering	Public Works Sale of Asphalt Millings, per ton	OTHER FEES	Resolution	5.00		per ton		
Public Works	Engineering	Sidewalk Inspection Fee (Full Parcel Sidewalk Construction)	57.042		47.00		EACH	07/01/23	
Public Works	Engineering	Sidewalk Inspection Fee (Partial Sidewalk Construction)	57.042		36.00		EACH	07/01/23	
Public Works	Engineering	Solid Waste Management Assessment- Commercial	51.001	Resolution	72.60		Annual - billed by waterworks		
Public Works	Engineering	Solid Waste Management Assessment-Agricultural with a water meter	51.001	Resolution	8.40		Annual - billed by waterworks		
Public Works	Engineering	Solid Waste Management Assessment-Industrial	51.001	Resolution	72.60		Annual - billed by waterworks		
Public Works	Engineering	Solid Waste Management Assessment-Multiple Family Residential, per family unit	51.001	Resolution	8.40		Annual - billed by waterworks		
Public Works	Engineering	Solid Waste Management Assessment-Single Family Residential	51.001	Resolution	8.40		Annual - billed by waterworks		
Public Works	Engineering	Solid Waste Management Assessment-Trailer Court / each lot	51.001	Resolution	8.40		Annual - billed by waterworks		
Public Works	Engineering	Street Patch Inspection			36.00		EACH	07/01/23	
Public Works	Engineering	Tunneling Permit	57.017	Resolution	36.00			07/01/23	
Public Works	Sewer	Sewer Revision (Disconnect, Repair, or Connect)	52.004	Res 2024-138	Cost		Each connection at cost	07/01/24	
Public Works	Sewer	Sanitary Sewer Connection - assessed	52.005	Ordinance	-		Each connection		
Public Works	Sewer	Sanitary Sewer connection fee - non assessed properties	52.005	Res 2024-138	Calculated			07/01/24	
Public Works	Sewer	Sanitary Sewer Deposit	52.006	Ordinance	40.00				
Public Works	Sewer	Sanitary Sewer Connection Fee (City Installed)	52.007		3,200.00		EACH		
Public Works	Sewer	Sanitary Sewer Connection Fee (Developer Installed)	52.007		300.00		EACH		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg 4" Pump (4 hour minimum)	52.074	Resolution	7.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg 6" Pump (4 hour minimum)	52.074	Resolution	13.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Air Compressor	52.074	Resolution	25.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Back Hoe	52.074	Resolution	50.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Back Hoe w/ Hammer or tamper	52.074	Resolution	65.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Concrete Saw	52.074	Resolution	45.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Dump Truck (2.5 ton)	52.074	Resolution	35.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg End loader	52.074	Resolution	65.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Hole Coring Saw	52.074	Resolution	20.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Jet Truck	52.074	Resolution	65.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Jet Vacuum truck	52.074	Resolution	90.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg One Ton Truck	52.074	Resolution	15.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Pickup Truck	52.074	Resolution	12.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Sewer Equip Chg Television truck	52.074	Resolution	90.00		Per hour. Note: All time for equipment shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer	Sewer Tap Charge 4" Service Lateral Connection	52.074	Resolution	200.00		(including labor, equipment & saddle)		
Public Works	Sewer	Sewer Tap Charge 6" Service Lateral Connection	52.074	Resolution	225.00		(including labor, equipment & saddle)		
Public Works	Sewer & Storm Sewer	Personnel Chgs Sewer Dept. Labor			40.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Personnel Chgs Sewer Dept. Labor Overtime			60.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Personnel Chgs Sewer Superintendent			55.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Sewer & Storm Sewer	Response or Repair to Hit Utility, Personnel & Equipment Charges		Res 2024-138	Calculated		2x established rates per hour. Note: all time shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Storm Sewer	COSESCO Permit - per acre plus $25 additional acre or portion thereof		Resolution	150.00		PER ACRE PLUS ADDL FEE $25 PER ACRE	07/01/23	
Public Works	Storm Sewer	Major Erosion Control Permit	55.003-55.013	Resolution	-		based on parcel size 150 per acre + 25 addl acre	07/01/23	
Public Works	Storm Sewer	Minor Erosion Control Permit	55.004 - 55.013	Resolution	-		based on parcel size 150 per acre + 25 addl acre	07/01/23	
Public Works	Storm Sewer	Public Works Construction Site Erosion Sediment	55.013	Resolution	-		based on parcel size 150 per acre + 25 addl acre	07/01/23	
Public Works	Storm Sewer	Storm Sewer Revision		Resolution	33.00		Each	07/01/23	
Public Works	Storm Sewer	Storm Water Rate	53.006 - 55.013	Ordinance	4.20		per ERU/month	07/01/24	
Public Works	Storm Sewer	Storm Water Utility rate - exemption and credit application fee	53.024	Resolution	100.00		100 for non residential and $50 for residential properties		
Public Works	Storm Sewer	SUDAS - in lieu of Detention-Commercial	53.026	Ordinance	13,500.00		per acre		
Public Works	Storm Sewer	SUDAS - in lieu of Detention-Industrial	53.026	Ordinance	12,000.00		per acre		
Public Works	Storm Sewer	SUDAS - in lieu of Detention-Low Density	53.026	Ordinance	6,000.00		per acre		
Public Works	Storm Sewer	SUDAS - in lieu of Detention-Medium High	53.026	Ordinance	12,000.00		per acre		
Public Works	Street	Personnel Charges Sewer Department Labor		Res 2024-138	40.00		Per hour. Note: all time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Street	Personnel Charges Sewer Department Labor Overtime		Res 2024-138	60.00		Per hour. Note: all time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Street	Personnel Charges Sewer Superintendent		Res 2024-138	50.00		Per hour. Note: all time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Street	Emergency Evacuation Response or Barricade Unsafe Right of Way Condition		Res 2024-138	Calculated		2x established rates per hour. Note: all time shall be charged a minimum of one hour unless otherwise noted.		
Public Works	Street	Special Events Trailer (delivery/pickup)	130.003	Ordinance	150.00				
Public Works	Street	Special Events (delivery/pickup 2+ barricades at specific locations)	130.003	Ordinance	300.00				
Public Works	Street	Special Events (delivery/pickup 1 or 2 barricades)	130.003	Ordinance	75.00				
Public Works	WPCP	Annual Inspection	52.074	Resolution	65.00		per hour		
Public Works	WPCP	Copies			0.25		per policy		
Public Works	WPCP	Copies - min 15 minutes labor charge			-		per policy		
Public Works	WPCP	Digestion (Emergency)	52.074	Resolution	20.00				
Public Works	WPCP	Digestion Fee (Metals)	52.074	Resolution	10.00				
Public Works	WPCP	Hourly pH	52.074	Resolution	15.00				
Public Works	WPCP	Investigation of Accidential Discharges/Slug Discharge	52.074	Resolution	62.00		per hour		
Public Works	WPCP	Lab Analysis Alkalinity			10.00				

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Public Works	WPCP	Lab Analysis Ammonia Nitrogen			15.00				
Public Works	WPCP	Lab Analysis Arsenic Furnace			19.00				
Public Works	WPCP	Lab Analysis BOD/CBOD			20.00				
Public Works	WPCP	Lab Analysis Cadmium Furnace			19.00				
Public Works	WPCP	Lab Analysis Chromium (Total) Furnace			19.00				
Public Works	WPCP	Lab Analysis COD			15.00				
Public Works	WPCP	Lab Analysis Copper Flame			12.00				
Public Works	WPCP	Lab Analysis Hach TKN			20.00				
Public Works	WPCP	Lab Analysis Lead Furnace			19.00			07/01/23	
Public Works	WPCP	Lab Analysis Molybdenum			19.00				
Public Works	WPCP	Lab Analysis Nickel Furnace			19.00			07/01/23	
Public Works	WPCP	Lab Analysis Nitrogen (Nitrate)			13.00				
Public Works	WPCP	Lab Analysis Oil & Grease			20.00				
Public Works	WPCP	Lab Analysis pH			5.00				
Public Works	WPCP	Lab Analysis Potassium			12.00				
Public Works	WPCP	Lab Analysis Selenium			19.00				
Public Works	WPCP	Lab Analysis Settleable Solids			7.00				
Public Works	WPCP	Lab Analysis Silver Flame			12.00				
Public Works	WPCP	Lab Analysis TKN EPA Method			25.00				
Public Works	WPCP	Lab Analysis Total Phosphorus			20.00				
Public Works	WPCP	Lab Analysis Total Solids			10.00				
Public Works	WPCP	Lab Analysis Total Suspended Solids (TSS)			10.00				
Public Works	WPCP	Lab Analysis Total Volatile Solids			10.00				
Public Works	WPCP	Lab Analysis Vol. Suspended Solids			10.00				
Public Works	WPCP	Lab Analysis Volatile Acids			20.00				
Public Works	WPCP	Lab Analysis Zinc Flame			12.00				
Public Works	WPCP	Monthly Billing for Lab Analysis			10.00		per month		
Public Works	WPCP	Mudpit Facility Registration			100.00		Annual		
Public Works	WPCP	Personnel Charges - Administrative Secretary			43.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	WPCP	Personnel Charges - Director			70.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	WPCP	Personnel Charges - Lab Chemist			52.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	WPCP	Personnel Charges - Plant Maintenance Overtime			69.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	WPCP	Personnel Charges - Plant Maintenance Personnel			49.00		Per hour. Note: All time for personnel shall be charged a minimum of one hour unless otherwise noted.		
Public Works	WPCP	Sample Handling	52.074	Resolution	20.00				

Dept	Div.	License or Permit Type	Code Section	How Fee Set	Fee	NEW FEE AMOUNT	License Term / per unit charge	Revised	Notes
Public Works	WPCP	Sampling Equipment / per day	52.074	Resolution	40.00		per day		
Public Works	WPCP	Waste Hauler	52.046	Ordinance	50.00		Annual - per vehicle		
Public Works	WPCP	Waste Water Appeal Filing Fee	52.074		100.00				
Public Works	WPCP	Waste Water Discharger Application Fee	52.074		125.00				
Public Works	WPCP	Waste Water Discharger Permit	52.075	Ordinance	250.00		establishes fee		
Public Works	WPCP	Waste Disposal - Grease Trap - In City		Ordinance	0.135		per gallon		
Public Works	WPCP	Waste Disposal - Grease Trap - Out of City	52.051	Ordinance	0.270		per gallon		
Public Works	WPCP	Waste Disposal - Septage Waste	52.051	Ordinance	0.118		per gallon		
Public Works	WPCP	Waste Disposal - Septage Waste - meter reading fee	52.051	Ordinance	10.00				
Public Works	WPCP	Waste Disposal - Mudpit Waste - In City	52.051	Ordinance	50.00		min per vehicle plus $25 for more than 2 cu. yd.		
Public Works	WPCP & Sewer	Vac Truck Contents Disposal - Slurry Mix of Clean Soil		Res 2024-138	30.00		per small load (5 CY +/-)	07/01/24	
Public Works	WPCP & Sewer	Vac Truck Contents Disposal - Slurry Mix of Clean Soil		Res 2024-138	60.00		per large load (10 CY +/-)	07/01/24	
Public Works	WPCP	Work Order	52.074	Resolution	10.00		each		

2024-226

RESOLUTION TO NAME DEPOSITORIES, ESTABLISH MAXIMUM DEPOSIT AMOUNTS, AND IDENTIFY POSITIONS AUTHORIZED TO CONDUCT BUSINESS ON BEHALF OF THE CITY OF MARSHALLTOWN

IT IS HEREBY RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA AS FOLLOWS:

Section 1. That the City Council of Marshalltown, Iowa does hereby name the following as official depositories for City funds and sets the maximum amount of deposit opposite the name of each institution effective October 28 2024:

DEPOSITORY NAME	MAXIMUM DEPOSIT
First Interstate Bank, Marshalltown, IA	$70,000,000
Alerus Financial NA, Marshalltown, IA	$35,000,000
US Bank, Marshalltown, IA	$35,000,000
Wells Fargo, Marshalltown, IA	$35,000,000
Pinnacle Bank, Marshalltown, IA	$35,000,000
Farmers Savings Bank, Marshalltown, IA	$35,000,000
United Bank & Trust, Marshalltown, IA	$35,000,000
Citizens Savings Bank, Marshalltown, IA	$35,000,000
Central State Bank, State Center, IA	$35,000,000
GNB Bank, Marshalltown, IA	$35,000,000
MidWestOne Bank, Melbourne & Conrad, IA	$35,000,000

Section 2. That the City Council of Marshalltown, Iowa does hereby name the following positions as having authority to invest funds: City Administrator, City Treasurer/Finance Director, City Accounting Manager.

Passed this 28th day of October, 2024, and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

MARSHALLTOWN
IOWA

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: October 23, 2024
RE: Resolution to Name Depositories, maximum Deposit Amounts, and Positions authorize to Conduct Business on Behalf of the City

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: Approve the change in the name of Home Federal to Alerus Financial.

Budget Impact: N/A

Description/Background: Council must name the official depositories and set the maximum amount of deposits per depository. First Interstate Bank provides our current checking accounts for operations, so that is why they have a higher limit than the other banks.

2024-227

RESOLUTION APPROVING AN INDEPENDENT CONTRACTOR AGREEMENT WITH CKENDALL CONSULTING, LLC

WHEREAS, the City of Marshalltown has negotiated certain terms and conditions of an Independent Contractor Agreement with CKendall Consulting LLC; and

WHEREAS, it is in the best interest of the City that said Independent Contractor Agreement should be approved by the Council of the City of Marshalltown, Iowa.

THEREFORE, IT IS HEREBY RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, AS FOLLOWS:

Section 1. An Independent Contractor Agreement which is hereby approved and ratified by the Council of the City of Marshalltown, Iowa.

Section 2. The Mayor and City Clerk are hereby authorized and directed to execute said agreement on behalf of the City of Marshalltown, Iowa.

Passed this 28th day of October 2024, and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

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

MARSHALLTOWN
IOWA

TO: Mayor & City Council
FROM: Carol Webb, City Administrator
DATE: October 23, 2024
RE: Independent Contractor Agreement with CKendall Consulting, LLC

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: Review policies, procedures, and ordinances for updates.

Recommendation: Approve the contractor agreement.

Budget Impact: An amount not to exceed $46,800

Description/Background: Cindy Kendall (CKendall Consulting, LLC.) is an independent contractor currently under contract with the City of Marshalltown to provide assistance with community development, nuisance program improvements, and other assignments as needed. This contract expires on October 31, 2024. The City Administrator desires to retain CKendall Consulting services to assist with community development activities (in absence of a Community Development and Housing Director), to support the finance department with financial reporting and other assignments, and other duties as needed as directed by the City Administrator. The proposed contract value is not to exceed $46,800 over the duration of the agreement.

The proposed contract is attached.

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

INDEPENDENT CONTRACTOR AGREEMENT FOR
CITY OF MARSHALLTOWN, IOWA

THIS INDEPENDENT CONTRACTOR AGREEMENT ("Agreement") made and entered into this _____ day of October 2024, by and between the City of Marshalltown, Iowa (hereinafter referred to as "City") and CKendall Consulting, LLC (hereinafter referred to as the "Contractor"), for and in consideration of the mutual covenants and agreements contained herein, agree as follows:

WHEREAS, the City desires to enter into an independent contract agreement with Contractor for assistance with administrative expertise; and

WHEREAS, Contractor desires to assist the City on an interim basis.

IT IS AGREED BY AND BETWEEN THE PARTIES AS FOLLOWS:

1. **Payment**. In consideration of the services to be prepared by Contractor, the City agrees to pay Contractor the following rates: $120 per hour not to exceed $46,800 over the duration of this Agreement. Contractor shall sign and submit an invoice to the City Clerk at the end of each month. Invoices shall include the dates covered by the invoice and a summary of the work performed. Invoices shall be approved by the City Council and following approval, payment shall be made to Contractor.

2. **Expenses.** The City agrees to provide Contractor with access to its technology systems as necessary to perform Contractor's duties under this Agreement. The City also agrees to provide Contractor with a City-owned device to access its technology systems. Other than these items, Contractor shall be responsible for all expenses incurred while performing services under this Agreement including vehicle expenses, vehicle maintenance and repair costs, vehicle license fees and permits, insurance premiums, including liability insurance and workers' compensation insurance, fuel, fines, cell phone expenses, internet expenses, meals, and all salary, expenses and other compensation paid to employees or contract personnel the Contractor hires to complete work under this agreement.

3. **Independent Contractor Status.** Contractor is an independent contractor. Neither Contractor, nor Contractor's employees or contract personnel are, or shall be deemed, the City's employees. In Contractor's capacity as an independent contractor, Contractor agrees and represents, and the City agrees, as follows:

   - Contractor has the right to perform services for others during the term of this Agreement.
   - Contractor has the sole right to control and direct the means, manner, and method by which the services required by this Agreement will be performed. Contractor shall select the routes taken, starting and quitting times, days of work, and order the work is performed.
   - Contractor shall not be required by the City to devote full time to the performance of the services required by this Agreement.

4. That the duties of the Contractor shall include, but not be limited to, the following:

- Contractor will work to do the following:
  - Provide guidance to developers, planners, P & Z and BOA as needed or requested by City Administrator.
  - Provide support to the Finance Department as needed as directed by the City Administrator.
  - Provide education to Council, Directors and others as identified.
  - Prepare presentation materials for Council meetings as needed and assigned.
  - Contractor shall attend Council meetings when requested.
  - Look at the Nuisance process with the City to identify process improvement and assist with enhancements.
  - Meet with department heads as needed on matters and provide mentorship.
- Contractor will work with the City Administrator and City staff on specific assignments and processes.
- Contractor will serve as the point of contact for Department Heads as needed and directed by the City Administrator.

5. **Compliance with Federal, State, and Local Laws.** Contractor represents and warrants that Contractor and Contractor's employees and contract personnel will comply with all federal, state, and local laws, including any licenses, permits, or certificates required to carry out the services to be performed under this Agreement.

   The Contractor acknowledges that all materials and communications generated during the execution of this Agreement are subject to Chapter 22 of the Code of Iowa and property of the City.

6. **State and Federal Taxes.** Contractor shall pay all taxes incurred while performing services under this Agreement, including all applicable state and federal income taxes and, if Contractor is not a corporation, self-employment (Social Security) taxes. Contractor shall be responsible for all necessary taxes for any employees or contract personnel hired by Contractor. The City shall not withhold FICA (Social Security and Medicare) taxes, state income taxes, or federal income taxes from payments to Contractor. The City shall not make FICA payments on behalf of Contractor.

7. **Fringe Benefits.** Contractor, Contractor's employees, or contract personnel are not eligible to participate in any employee pension, health, vacation pay, sick pay, or other fringe benefit plan of the City.

8. **Unemployment Compensation.** The City shall make no state or federal unemployment compensation payments on behalf of Contractor, Contractor's employees, or contract personnel hired by Contractor. Contractor, Contractor's

employees, and contract personnel shall not be entitled to unemployment compensation benefits in connection with work performed under this Agreement.

9. **Workers' Compensation Insurance.** The City shall not obtain workers' compensation insurance on behalf of Contractor, Contractor's employees, or contract personnel. Contractor shall be responsible for workers' compensation insurance for any employees or contract personnel hired by Contractor to perform work under this Agreement.

10. **Indemnification.** Contractor shall indemnify and hold the City harmless from any loss or liability arising from performing services under this Agreement.

11. **Terms of Agreement.** This Agreement will become effective when signed by both parties and terminate upon mutual consent of both parties.

12. **Terminating the Agreement.** Either Contractor or the City may terminate this Agreement effective upon receipt of notice from the other in writing or by email.

13. **Complete Agreement.** This is the entire Agreement between Contractor and the City.

14. **Modifying the Agreement.** This Agreement may be modified only by a writing signed by both parties.

15. **Jurisdiction.** The parties consent to the jurisdiction and venue of the Iowa District Court for the enforcement of any and all provisions of this Agreement, both now and in the future.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the _____ day of _____, 2024.

CITY OF MARSHALLTOWN

_____
Carol Webb, City Administrator

ATTEST:

_____
Alicia Hunter, City Clerk

INDEPENDENT CONTRACTOR

_____
Cindy Kendall, MPA
CKendall Consulting, LLC

2024-228

RESOLUTION ORDERING CONSTRUCTION OF THE LINN CREEK TRAILHEAD AND BRIDGE PROJECT #TRL24001 AND #TRL24002, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND ESTIMATED COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS

WHEREAS, there is now on file in the office of the City Clerk proposed plans, specifications, form of contract, and estimated costs for the Linn Creek Trailhead and Bridge Project, in the City of Marshalltown, Iowa, as is fully set forth in the plans and specifications for Project No TRL24001 and TRL24002; and

WHEREAS, the cost of the said improvement is in excess of $25,000 and a public hearing on the plans, specifications, form of contract and the estimated cost of said improvement is required by law and that notice thereof shall be given as required by law; and

WHEREAS, it is intended that the cost of said improvement shall be paid from such funds as the City may legally use for such purposes or from the proceeds from the issuance of such bonds as may be legally issued for said purposes or any combination of the above methods of financing.

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

Section 1. This Council does hereby order the construction of the Linn Creek Trailhead and Bridge Project in the City of Marshalltown, Iowa, which public improvement is fully and particularly described in the plans and specifications for Project No. TRL24001 and TRL24002, now on file in the office of the City Clerk of Marshalltown, Iowa.

Section 2. That the method of construction shall be by contract in accordance with the plans and specifications and general stipulations for the said improvement approved by the City Council.

Section 3. The Contractor will be paid in monthly estimates for work completed as set out in the specifications. The project shall begin on or near the appropriate starting date as specified on the form of proposal and shall be completed within the specified number of calendar days also indicated thereon.

Section 4. That the said improvements shall be paid for from such funds of the City as may be legally used for such purposes, or from the proceeds of the issuance of such bonds as may be legally issued for such purposes or from any combination of such methods of financing and will be paid in accordance with the Notice to Bidders duly published in connection therewith. The Finance Director shall establish on the books a Linn Creek Trailhead and Bridge Project fund and the bond proceeds or such funds of the City as may be legally used for such purposes are hereby appropriated to pay all costs of the improvements including legal publication, bond, design, engineering, survey and inspection, contract and contingency cost as estimated by the Engineer. The Finance Director is directed to advance all sums necessary from the project fund, and to set up on the books the obligations and receivables of the fund.

Section 5. The City Clerk is hereby directed to publish notice of hearing on plans, specifications, and form of contract and estimated cost in the manner provided by law for the public improvement outlined herein and that any person interested therein may appear and make objections thereto, if any he has. This Council will meet in the Council Chamber, Second Floor, 10 West State Street at Marshalltown, Iowa, at 5:30 P.M., local time on November 11, 2024, for the purpose of hearing all of said objections so made and for taking final action upon the plans, specifications, and form of contract now on file.

Section 6. Staff is further directed to advertise for bids in the manner provided by law for the construction of said improvements, setting forth in said notice such necessary pertinent information as will advise prospective bidders thereof together with the proposed manner of payment of the work to be constructed and that such bids be filed and received in the office of the City Clerk of Marshalltown, Iowa, up to 10:00 A.M., local time, on November 19, 2024. The bids will be opened, read, and tabulated by the Public Works Director or their designate at that time and will be acted upon by the City Council of said City at a meeting to be held in the Council Chambers, Second Floor, 10 West State Street, Marshalltown, Iowa, at 5:30 P.M., local time, on November 25, 2024, or at such later time and place as may then be fixed for considering such bids as shall be filed in connection with the improvement herein ordered and in compliance with the notice of taking bids therein, hereby ordered to be published.

Passed this 28th day of October 2024, and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

MARSHALLTOWN
IOWA
Parks & Recreation

Joel Greer, Mayor
Alicia Hunter, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5715
Fax - (641) 754-5717

To: Mayor Greer and the City Council
From: Geoff Hubbard, Parks & Recreation Director
Date: August 27, 2024
RE: Order Construction – Linn Creek Trailhead and Bridge – TRL24002 & TRL24001

Policy Issue: City policy requires Governing Body approval of Resolution ordering construction.

Recommendation: Staff recommends approving the Resolution ordering construction of the Linn Creek Trailhead and Bridge – TRL24002 & TRL24001

Background: This project includes the construction of a trailhead with a restroom building, shelters, and other amenities and a new pedestrian bridge over the Linn Creek connecting to the 6th Street Trail. These are two of four projects in the Linn Creek District that was partially funded by a $2 million Destination Iowa grant.

Budget Impact: This project will be funded with 364 funds, Destination Iowa grant, Wellmark grant, and private donations.

Attachment: None

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

PRELIMINARY OPINION OF PROBABLE CONSTRUCTION BUDGET
LINN CREEK TRAILHEAD
MARSHALLTOWN, IA
October 22, 2024

SNYDER & ASSOCIATES

Project Number 124.0187.01

ITEM	DESCRIPTION	QUANTITY		UNIT PRICE	EXTENSION
BASE IMPROVEMENTS					
1	Mobilization/General Conditions	1	LS	$150,000.00	$150,000.00
2	Tree Removal	1	LS	$8,000.00	$8,000.00
3	Pavement Removal (HMA Trail, Parking, Old Road, and Gravel Area)	1,875	SY	$18.00	$33,750.00
4	Remove/Salvage Pump Track	1	LS	$6,000.00	$6,000.00
5	Remove/Dispose Chain Link Fence	350	LF	$5.00	$1,750.00
6	Remove/Dispose Graffiti Wall	1	LS	$1,750.00	$1,750.00
7	Strip, Stockpile, Respread Topsoil	300	CY	$9.00	$2,700.00
8	On-Site Earthwork	1,500	CY	$10.00	$15,000.00
9	Import Fill Allowance	1,000	CY	$20.00	$20,000.00
10	Import Topsoil	100	CY	$60.00	$6,000.00
11	Erosion Control	1	LS	$12,500.00	$12,500.00
12	6" Depth PCC	1,925	SY	$82.00	$157,850.00
13	8" Width PCC Concrete Edger	325	LF	$35.00	$11,375.00
14	6" PCC Curb and Gutter	60	LF	$40.00	$2,400.00
15	Site Retaining Wall at East Overlook	1	LS	$120,000.00	$120,000.00
16	Steel Decorative Handrail	85	LF	$135.00	$11,475.00
				TOTAL BASE IMPROVEMENTS	**$549,075.00**
UTILITIES					
17	Perforated PE Subdrain, 4" (Allowance)	500	LF	$26.00	$13,000.00
18	HDPE Storm Sewer	340	LF	$70.00	$23,800.00
19	RCP Storm Sewer	105	LF	$90.00	$9,450.00
20	RCP Flared End Section	2	EA	$5,000.00	$10,000.00
21	Nyloplast Storm Basin	3	EA	$4,000.00	$12,000.00
22	Nyloplast In-line Drain	2	EA	$1,500.00	$3,000.00
23	Curb Intake	2	EA	$4,000.00	$8,000.00
24	Storm Manhole	4	EA	$6,000.00	$24,000.00
25	Water Service (2")	25	LF	$120.00	$3,000.00
26	Meter Pit	1	LS	$15,000.00	$15,000.00
27	2" Isolation Valve	1	EA	$1,200.00	$1,200.00
28	Winterization Valve/Blow-off	1	LS	$4,000.00	$4,000.00
29	Drinking Fountain with Bottle Filler, 1" Service	1	LS	$12,000.00	$12,000.00
30	4" Sanitary Sewer Line	15	LF	$120.00	$1,800.00
31	Sanitary Sewer Cleanout	1	EA	$1,200.00	$1,200.00
32	Drop Service Manhole (20' Deep)	1	EA	$20,000.00	$20,000.00
33	Site Utility Service and Transformer	1	LS	$10,000.00	$10,000.00
34	Electrical Service	1	LS	$10,000.00	$10,000.00
35	Shelter Lighting	1	LS	$12,000.00	$12,000.00
36	Shelter Power	1	LS	$10,000.00	$10,000.00
37	Site Lighting (Pedestrian and Parking)	1	LS	$136,000.00	$136,000.00
38	Telecom and Security Rough-Ins	1	LS	$15,000.00	$15,000.00
				TOTAL UTILITY IMPROVEMENTS	**$354,450.00**
SITE AMENITIES					
39	Monoslope Event Shelter (30' x 16')	1	LS	$55,000.00	$55,000.00
40	Monoslope Picnic Shelter (15' x 15')	1	LS	$35,000.00	$35,000.00
41	Restroom Building (17' x 17')	1	LS	$260,000.00	$260,000.00
42	Restroom Building Foundation, Stoops, Slab	1	LS	$25,000.00	$25,000.00
43	Overhead Structure at Overlook	1	LS	$60,000.00	$60,000.00
44	Lawn Seed and Hydromulch	1.0	AC	$7,000.00	$7,000.00
45	Native Seed and Hydromulch	0.5	AC	$8,000.00	$4,000.00
46	Landscaping (Shrubs, Perennials, etc.)	100	EA	$75.00	$7,500.00
47	Overstory Trees	10	EA	$675.00	$6,750.00
48	Ornamental Trees	4	EA	$550.00	$2,200.00
49	Evergreen Trees	10	EA	$600.00	$6,000.00
50	Bike Racks	20	EA	$750.00	$15,000.00
51	Bike Fix-It Station	1	EA	$5,000.00	$5,000.00
52	Benches - Custom Metal Panel Design	5	EA	$4,000.00	$20,000.00
53	Trash Receptacles - Custom Metal Panel Design	3	EA	$3,000.00	$9,000.00
54	Picnic Tables	3	EA	$2,500.00	$7,500.00
55	Trailhead Kiosk and Wayfinding Signage	1	LS	$50,000.00	$50,000.00
				TOTAL SITE AMENITIES	**$574,950.00**
BRIDGE IMPROVEMENTS					
56	6th Street Bridge Demolition and Removal	1	LS	$80,000.00	$80,000.00
57	Truss Bridge, Modified Keystone with Overlooks, 145'x 12'	1	LS	$341,700.00	$341,700.00
58	Erection Cost	1	LS	$70,000.00	$70,000.00
59	Concrete Deck	1,800	SF	$18.00	$32,400.00
60	Excavation Class 20	130	CY	$50.00	$6,500.00
61	Structural Concrete (Bridge)	40	CY	$1,100.00	$44,000.00
62	Reinforcing Steel, Epoxy Coated	5,080	CY	$2.00	$10,160.00
63	Piles, Steel, HP 10x57	520	LF	$70.00	$36,400.00
64	Railing and Overhead Panels Allowance	1	LS	$270,000.00	$270,000.00
65	Lighting Allowance	1	LS	$140,000.00	$140,000.00
				TOTAL BRIDGE IMPROVEMENTS	**$1,031,160.00**
				BASE BID SUBTOTAL	$2,509,635.00
				CONTINGENCY (10%)	$251,000.00
				BASE BID CONSTRUCTION COST	**$2,761,000.00**

This opinion of probable cost was completed using a preliminary concept. Snyder & Associates, Inc. is not responsible for any discrepancies between this assumed layout and quantities and the actual bids of the final plans and final quantities.

NOTICE TO BIDDERS

JURISDICTION OF **CITY OF MARSHALLTOWN** PUBLIC IMPROVEMENT PROJECT

LINN CREEK TRAILHEAD

Notice is hereby given that a public hearing will be held by the **City of Marshalltown, Iowa** on the proposed contract documents (plans, specifications, and form of contract) and estimated cost for the improvement at its meeting at **5:30 PM** on **NOVEMBER 11, 2024,** in said **City Council Chambers, at 10 West State Street, Marshalltown, IA 50158** for the **Linn Creek Trailhead.**

Sealed bids for the work comprising each improvement as stated below must be filed before **10:00 A.M.** according to the clock in the office of **the City Clerk** on **NOVEMBER 19, 2024** in the office of the **City Council Chambers, at 10 West State Street, Marshalltown, IA 50158**. Bids received after the deadline for submission of bids as stated herein shall not be considered and shall be returned to the late bidder unopened.

Sealed proposals will be opened and bids tabulated at **10:00 A.M**. on **NOVEMBER 19, 2024**, in the **City Council Chambers, at 10 West State Street, Marshalltown, IA 50158** for consideration by the **City Council of Marshalltown, Iowa** at its meeting on **NOVEMBER 25, 2024.**

Work on the improvement shall be commenced immediately upon approval of the contract by the Council, and be completed as stated below.

Hardcopies of the contract documents of the project documents may be obtained from Snyder & Associates, Inc. 2727 SW Snyder Blvd, Ankeny, Iowa 50023. Electronic contract documents are available at no cost by clicking on the "Bids" link at www.snyder-associates.com and choosing the **Linn Creek Trailhead** on the left. Project information, engineer's cost opinion, and planholder information is also available at no cost at this website. Downloads require the user to register for a free membership at QuestCDN.com.

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.

In accordance with Iowa statutes, a resident bidder shall be allowed a preference as against a nonresident bidder from a state or foreign country if that state or foreign country gives or requires any preference to bidders from that state or foreign country, including but 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.

General Nature of the Public Improvement

Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.

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 and will furnish after the award of contract a corporate surety bond, in a form acceptable to the Jurisdiction, for the faithful performance of the contract, in an amount equal to 100% of the amount of the contract. The bidder's security shall be in the amount fixed in the Instruction to Bidders and shall be in the form of a cashier's check or a certified check drawn on an FDIC insured bank in Iowa or on an FDIC insured bank chartered under the laws of the United States; or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States; or a bid bond on the form provided in the contract documents with corporate surety satisfactory to the Jurisdiction. The bid shall contain no condition except as provided in the specifications.

The **City of Marshalltown** reserves the right to defer acceptance of any bid for a period of sixty (60) calendar days after receipt of bids and no bid may be withdrawn during this period.

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 and the terms and conditions therein contained and shall guarantee the prompt payment of all material and labor, and protect and save harmless **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 two years from and after acceptance of the contract. The guaranteed maintenance period for new paving shall be four years.

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 insure 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.

Contractor shall substantially complete project work by **October 1, 2025,** and complete all work no later than **October 15, 2025**. Should the contractor fail to complete the work in this timeframe, liquidated damages of **$500** per calendar day will be assessed for work not completed within the designated contract term.

The **City of Marshalltown** does hereby reserve the right to reject any or all bids, to waive informalities, and to enter into such contract, or contracts, as it shall deem to be in the best interest of the jurisdiction.

This Notice is given by authority of the **City of Marshalltown, Iowa**

_____

Joel Greer, Mayor
Marshalltown, Iowa

NOTICE OF HEARING

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT, AND ESTIMATE OF COST FOR THE **LINN CREEK TRAILHEAD** FOR THE **CITY OF MARSHALLTOWN.**

Public Notice is hereby given that at **5:30 PM** on the **11TH OF NOVEMBER, 2024**, the **City Council of Marshalltown, Iowa** will, in the **City Council Chambers at 10 West State Street, Marshalltown, IA 50158** hold a hearing whereat said **City Council.** will resolve to adopt plans, specifications, form of contract and estimate of cost for the construction of the **Linn Creek Trailhead** and, at the time, date and place specified above, or at such time, date and place as then may be fixed, to act upon proposals and enter into contract for the construction of said improvements.

General Nature of the Public Improvement
Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.

At said hearing, the **City Council**, will consider the proposed plans, specifications, form of contract and estimate of cost for said project, the same now being on file in the **City Council Chambers, at 10 West State Street, Marshalltown, IA 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 comments/objections to said plans, specifications and form of contract or to the estimated cost of said improvements made by any interested party.

This Notice is given by authority of the **City of Marshalltown**

_____
Joel Greer, Mayor
Marshalltown, Iowa

Published in the _____

CONSTRUCTION PLANS
FOR
LINN CREEK TRAILHEAD
CITY OF MARSHALLTOWN, IOWA

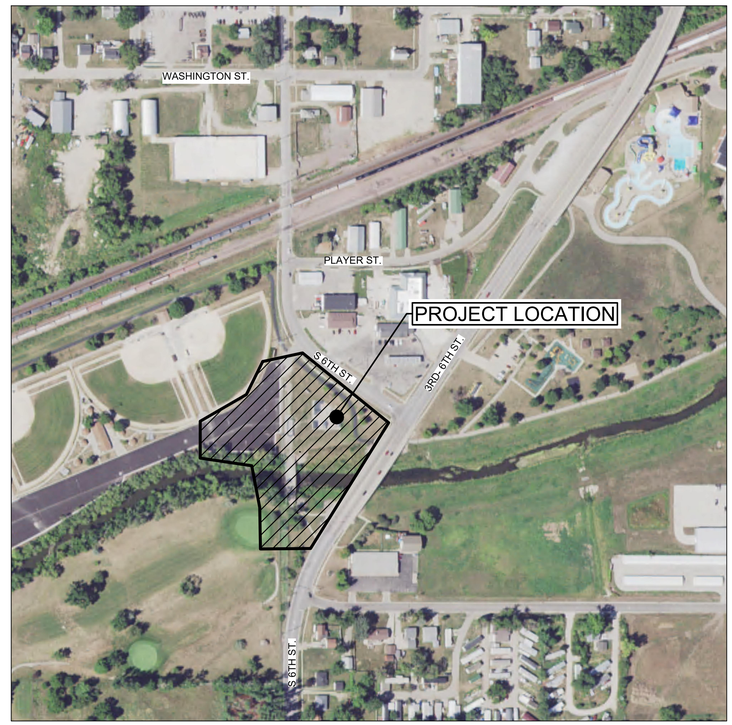
OWNER / DEVELOPER

PUBLIC WORKS DIRECTOR
CITY OF MARSHALLTOWN
24 NORTH CENTER STREET
MARSHALLTOWN, IOWA 50158
CONTACT: HEATHER THOMAS, PE
PHONE: 641-754-5734 EXT. 4100
EMAIL: HTHOMAS@MARSHALLTOWN-IA.GOV

ENGINEER

SNYDER & ASSOCIATES, INC.
2727 SNYDER BLVD.
ANKENY, IOWA 50023

CONTACT: TIM WEST, PLA
T: (515) 669-3248

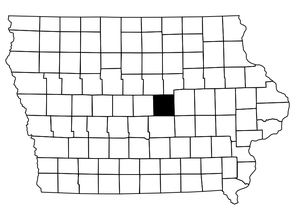


VICINITY MAP

SCALE: 1" = 200'

Sheet List Table

C001	TITLE SHEET
C002	PROJECT INFORMATION
C003	STAGING PLAN AND GENERAL NOTES
C100	DEMOLITION PLAN
C200	OVERALL SITE LAYOUT PLAN
C201	DIMENSION PLAN - PLAZA AREA
C202	JOINTING PLAN - PLAZA AREA
C300	UTILITY PLAN
C400	GRADING, POLLUTION PREVENTION, AND EROSION CONTROL PLAN
C401	GRADING PLAN - PLAZA AREA
C402	RETAINING WALL
C403	RETAINING WALL NOTES AND DETAILS
C404	GRADING PLAN - BIORETENTION AREAS
C500	LANDSCAPE PLAN
C600	SITE DETAILS
C601	SITE DETAILS - STORM SEWER
C602	SIGNAGE DETAILS
C603	SHELTER DETAILS
C604	OVERHEAD STRUCTURE DETAILS
C605	RESTROOM DETAILS
C606	RESTROOM DETAILS
C607	RESTROOM DETAILS
C608	RESTROOM DETAILS
C609	RESTROOM DETAILS
E000	ELECTRICAL GENERAL NOTES & SYMBOLS
E001	ELECTRICAL SITE UTILITY & REFERENCE PLAN
E002	ELECTRICAL SITE LIGHTING PLAN
E003	ELECTRICAL SITE PHOTOMETRIC PLAN
E101	ELECTRICAL FLOOR PLANS
E401	ELECTRICAL ONE-LINE DIAGRAM & DETAILS
E402	ELECTRICAL SCHEDULES
E501	ELECTRICAL DETAILS
TT000	TELECOM GENERAL NOTES & SYMBOLS
TT101	TELECOM SITE PLAN
TT300	TELECOM DETAILS
G001	SURVEY CONTROL AND REFERENCE INFORMATION
V001	ESTIMATED BRIDGE QUANTITIES
V002	GENERAL NOTES
V003	GENERAL NOTES
V004	BRIDGE SITUATION PLAN
V005	ABUTMENT DETAILS
V006	ABUTMENT DETAILS
V007	ABUTMENT DETAILS
V008	ORNAMENTAL FENCE DETAILS
V009	SUBDRAIN DETAILS
V010	BACKFILL DETAILS



LICENSED PROFESSIONAL ENGINEER
RICHARD M. VOELKER
P13853
IOWA

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.

Richard M. Voelker, P.E. Date

License Number P13853

My License Renewal Date is December 31, 2024

Pages or sheets covered by this seal:

STATE OF IOWA
TIMOTHY L. WEST
LANDSCAPE ARCHITECT
NO. 412
PROFESSIONAL LANDSCAPE ARCHITECT

License Expires:
June 30, 2025

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.

Timothy L. West, PLA Date

License Number 412

Pages or sheets covered by this seal:

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = 20'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C001

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

TITLE SHEET

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C001

V:\Projects\2024\124.0187.01\CADD\SHN 124.0187 TITLE sheet SHANE T TULLY TITLE SHEET 2024/10/22 4:57 PM, ARCH FULL BLEED (36.00 X 24.00 INCHES)

EXISTING SITE SURVEY

LEGEND

FEATURES	FOUND	SET
Section Corner	▲	△
1/2" Rebar, Cap # 11579 (Unless Otherwise Noted)	●	○
ROW Marker	■	□
ROW Rail	H	H
Control Point	⊙CP	
Bench Mark		
Platted Distance	P	
Measured Bearing & Distance	M	
Recorded As	R	
Deed Distance	D	
Calculated Distance	C	
Minimum Protection Elevation	MPE	
Centerline		
Section Line		
1/4 Section Line		
1/4 1/4 Section Line		
Easement Line		

FEATURES EXISTING

Spot Elevation	X 1225.25
Contour Elevation	1225
Fence (Barbed, Field, Hog)	X
Fence (Chain Link)	//
Fence (Wood)	□
Fence (Silt)	○
Tree Line	
Tree Stump	
Deciduous Tree \\ Shrub	
Coniferous Tree \\ Shrub	
Communication	C(*)
Overhead Communication	OC(*)
Fiber Optic	FO(*)
Underground Electric	E(*)
Overhead Electric	OE(*)
Gas Main with Size	G(*)
High Pressure Gas Main with Size	
Water Main with Size	W(*)
Sanitary Sewer with Size	S(*)
Duct Bank	DUCT(*)
Test Hole Location for SUE w/ID	

(*) Denotes the survey quality service level for utilities

Sanitary Manhole	
Storm Sewer with Size	ST(*)
Storm Manhole	
Single Storm Sewer Intake	
Double Storm Sewer Intake	
Fire Hydrant	
Fire Hydrant on Building	
Water Main Valve	
Water Service Valve	
Well	
Utility Pole	
Guy Anchor	
Utility Pole with Light	
Utility Pole with Transformer	
Street Light	
Yard Light	
Electric Box	
Electric Transformer	
Traffic Sign	
Communication Pedestal	
Communication Manhole	
Communication Handhole	
Fiber Optic Manhole	
Fiber Optic Handhole	
Gas Valve	
Gas Manhole	
Gas Apparatus	
Fence Post or Guard Post	
Underground Storage Tank	UST
Above Ground Storage Tank	AST
Sign	
Satellite Dish	
Mailbox	
Sprinkler Head	
Irrigation Control Valve	ICV

UTILITY QUALITY SERVICE LEVELS

QUALITY LEVELS OF UTILITIES ARE SHOWN IN THE PARENTHESES WITH THE UTILITY TYPE AND WHEN APPLICABLE, SIZE. THE QUALITY LEVELS ARE BASED ON THE CI / ASCE 38-02 STANDARD.
QUALITY LEVEL (D) INFORMATION IS DERIVED FROM EXISTING UTILITY RECORDS OR ORAL RECOLLECTIONS.
QUALITY LEVEL (C) INFORMATION IS OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION WITH QUALITY D INFORMATION.
QUALITY LEVEL (B) INFORMATION IS OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES.
QUALITY LEVEL (A) IS HORIZONTAL AND VERTICAL POSITION OF UNDERGROUND UTILITIES OBTAINED BY ACTUAL EXPOSURE OR VERIFICATION OF PREVIOUSLY EXPOSED SUBSURFACE UTILITIES, AS WELL AS THE TYPE, SIZE, CONDITION, MATERIAL, AND OTHER CHARACTERISTICS.

UTILITY WARNING

THE UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND/OR RECORDS OBTAINED. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES OR SUBSURFACE FEATURES SHOWN COMPRISE ALL SUCH ITEMS IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UTILITIES OR SUBSURFACE FEATURES SHOWN ARE IN THE EXACT LOCATION INDICATED EXCEPT WHERE NOTED AS QUALITY LEVEL A.

UTILITY CONTACT INFORMATION

UTILITY CONTACT FOR MAPPING INFORMATION SHOWN AS RECEIVED FROM THE IOWA ONE CALL DESIGN REQUEST SYSTEM, TICKET NUMBER 552404875.

G1-GAS MAIN	ALLIANT ENERGY ALLIANT ENERGY FIELD ENGINEER 800-255-4268 LOCATE_IPL@ALLIANTENERGY.COM
FO1-FIBER OPTIC C1-COMMUNICATION CLEAR BY MAPPING	CENTURYLINK SADIE HULL 918-547-0147 SADIE.HULL@LUMEN.COM
FO19-FIBER OPTIC	HEART OF IOWA VENTURES NATHAN BUTLER 641-486-2211 NBUTLER@HEARTOFIOWA.COOP
FO5-FIBER OPTIC CLEAR BY MAPPING	IOWA COMMUNICATIONS NETWORK DAVE AUGSPURGER 515-725-4604 ICNOUTSIDEPLANTIOWAONECALL@IOWA.GOV
FO20-FIBER OPTIC	MNA/BLUEBIRD JAMIE SCOTT 314-270-8738 JAMES.SCOTT@BLUEBIRDNETWORK.COM
E1-BURIED ELECTRIC OE1-OVERHEAD ELECTRIC	MARSHALLTOWN, CITY OF ELECTRIC DAVID DEEMER 641-754-5734 LOCATE-ELECTRIC@MARSHALLTOWN-IA.GOV
S1-SEWER	MARSHALLTOWN, CITY OF SEWER TROY MCGAHUEY 641-754-5749 DESIGN-SEWER@MARSHALLTOWN-IA.GOV
W1-WATER	MARSHALLTOWN WATER WORKS ZACH MAXFIELD 641-753-7913 ZACH@MARSHALLTOWNWATER.COM
C2-COMMUNICATION	MEDIACOM WOLFGANG SPENCER 845-587-2497 WSPENCER@MEDIACOMCC.COM
CLEARED BY MAPPING	U.S. CELLULAR TERESA MACHNIK 608-444-3610 TERESA.MACHNIK@USCELLULAR.COM
FO3-FIBER OPTIC	WINDSTREAM ENTERPRISE CLEC LOCATE DESK 800-941-3430 WCI.CLEC.LOCATE@WINDSTREAM.COM

CONTROL POINTS

IOWA REGIONAL COORDINATE SYSTEM ZONE 9
NAD83(2011)(EPOCH 2010.00) IARTN DERIVED - US SURVEY FEET

CP1 N=7851422.43 E=19471553.40 Z=892.91
FOUND CUT "X" NORTHWEST CORNER SIDEWALK LANDING OF BRIDGE ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP2 N=7851420.80 E=19471649.64 Z=892.22
FOUND CUT "X" NORTHEAST CORNER SIDEWALK LANDING OF BRIDGE ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP3 N=7851149.46 E=19471468.08 Z=892.77
FOUND CUT "X" SOUTHEAST CORNER SIDEWALK LANDING OF BRIDGE ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP4 N=7851150.22 E=19471371.19 Z=893.07
FOUND CUT "X" SOUTHWEST CORNER SIDEWALK LANDING OF BRIDGE ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP5 N=7851211.24 E=19471297.39 Z=891.56
FOUND CUT "X" TOP OF ABUTMENT ON SOUTHEAST CORNER PEDESTRIAN BRIDGE WEST OF 3RD STREET - 6TH STREET. (AS SHOWN ON SURVEY)

CP6 N=7851343.56 E=19471295.48 Z=891.59
FOUND CUT "X" TOP OF ABUTMENT ON NORTHEAST CORNER PEDESTRIAN BRIDGE WEST OF 3RD STREET - 6TH STREET. (AS SHOWN ON SURVEY)

CP100 N=7851755.81 E=19471306.28 Z=887.42
SET CUT "X" TOP OF CURB, EAST SIDE S. 6TH STREET, ±75' WEST OF BRICK BRIDGE, ±5' WEST OF MARSHALLTOWN SIGN. (AS SHOWN ON SURVEY)

CP101 N=7851440.96 E=19471000.33 Z=889.03
SET CUT "X" TOP OF CURB, NORTH SIDE PARKING LOT, ±60' WEST OF FIELD SPLIT. (AS SHOWN ON SURVEY)

CP102 N=7850928.58 E=19471415.87 Z=885.44
FOUND MAG NAIL, NORTHWEST CORNER STORM STRUCTURE, NORTH SIDE W. HIGH STREET, ±12' SOUTHWEST OF HYDRANT. (AS SHOWN ON SURVEY)

BENCHMARKS

NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88 - GEOID12A)
IARTN DERIVED - US SURVEY FEET

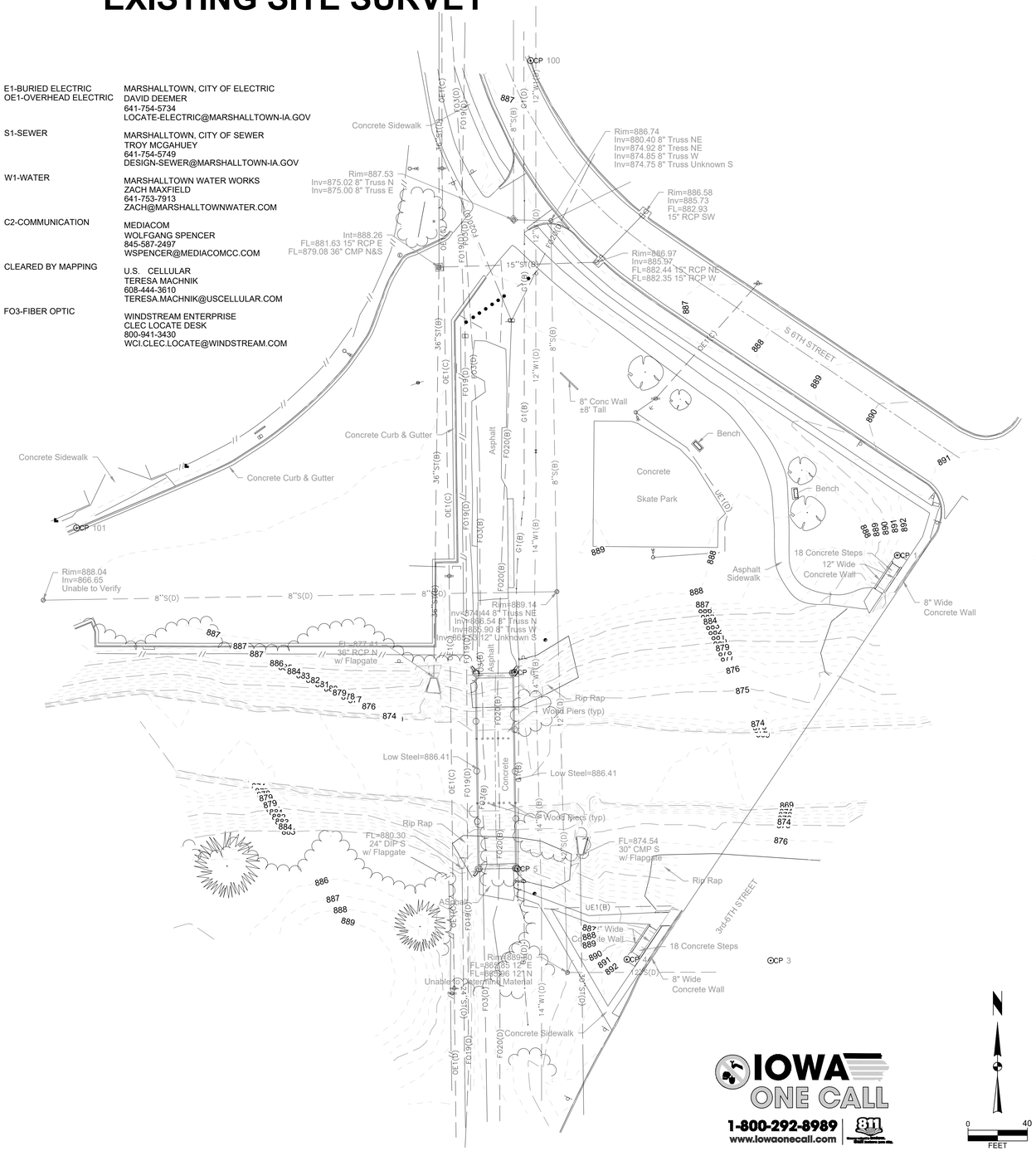
BM500 N=7851343.55 E=19471295.47 ELEV=891.59
FOUND CUT "X" TOP OF ABUTMENT, NORTHEAST CORNER PEDESTRIAN BRIDGE, WEST OF 3RD/6TH STREET BRIDGE.

DATE OF SURVEY

AUGUST 19, 2024

NOTES

1. BUILDING LINES AND CORNERS ARE FOR USE IN PREPARING CIVIL SITE PLAN DOCUMENTS. BUILDING CORNERS AND BUILDING LINES SHOULD BE SPECIFICALLY VERIFIED, AS NECESSARY, PRIOR TO DESIGN FOR CONSTRUCTION OF ANY PROPOSED EXPANSION OR CONNECTION OF BUILDING COMPONENTS.
2. FOR CLARITY PURPOSES, SURVEY SPOT ELEVATIONS ARE NOT SHOWN ON THIS SURVEY, BUT ARE CONTAINED WITHIN THE DIGITAL CADD FILES.
3. FOR THE PURPOSE OF THIS SURVEY, STORM SEWER, SANITARY SEWER AND WATER MAIN LINES ARE ASSUMED TO FOLLOW A STRAIGHT LINE FROM STRUCTURE TO STRUCTURE.
4. UTILITY SERVICE LINES TO BUILDINGS ARE APPROXIMATE ONLY. AN INTERNAL BUILDING INVESTIGATION, EXCAVATION AND/OR SUBSURFACE LOCATING/DESIGNATING WOULD NEED TO BE PERFORMED TO DETERMINE THE LOCATION OF SERVICES ENTERING THE BUILDING.
5. UNDERGROUND PIPE MATERIALS AND SIZES ARE BASED UPON VISIBLE EVIDENCE VIEWED FROM ACCESS MANHOLES/STRUCTURES. DUE TO THE CONFIGURATION AND/OR CONSTRUCTION OF THE STRUCTURE, IT MAY BE DIFFICULT TO ACCURATELY DETERMINE THE PIPE MATERIAL AND/OR SIZE. THE SURVEYOR WILL USE THEIR JUDGMENT AND EXPERIENCE TO ATTEMPT TO DETERMINE, BUT COMPLETE ACCURACY CANNOT BE GUARANTEED.
6. BOUNDARY LINES SHOWN ON THE EXISTING SITE SURVEY ARE TO FACILITATE DESIGN OR CONCEPT NEEDS AND ENABLE CREATION OF SAID CONSTRUCTION DOCUMENTS. THESE LINES DO NOT CONSTITUTE A CERTIFIED BOUNDARY SURVEY AND MISSING MONUMENTS WILL NOT BE SET.



MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##"
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C002

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

PROJECT INFORMATION

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C002

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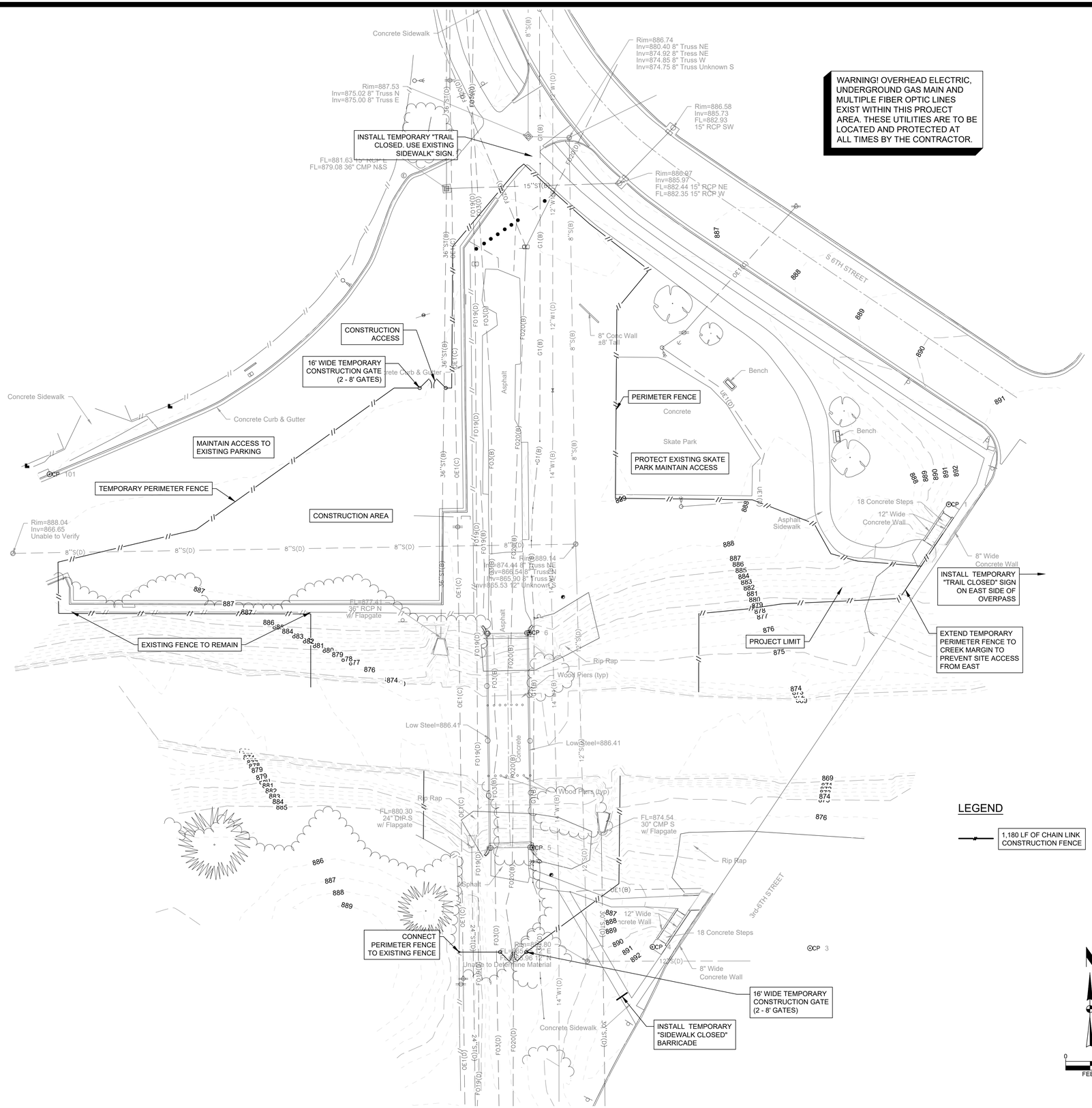

STAGING NOTES

A. CONTRACTOR TO PREPARE A PROJECT STAGING PLAN SHOWING CONSTRUCTION ACCESS POINTS, FENCE LOCATIONS, GATE LOCATIONS, MATERIAL STORAGE AREAS, WORKER PARKING, AND LOCATION OF JOB TRAILER, IF DESIRED, FOR OWNER AND ENGINEER APPROVAL PRIOR TO CONSTRUCTION.

B. CONTRACTOR RESPONSIBLE FOR SECURING THE PROJECT SITE NIGHTLY AND MAINTAINING THE LAWN AREAS WITHIN AND ADJACENT TO THE FENCING, INCLUDING TRIMMING AND WEED CONTROL.

C. CONTRACTOR SHALL NOT STORE ANY MATERIALS OR PARK EQUIPMENT OR VEHICLES OUTSIDE OF THE APPROVED CONSTRUCTION LIMITS.

D. KEEP ALL MATERIALS, EQUIPMENT, PERSONAL VEHICLES, ETC. OUT OF THE CITY R.O.W. AND SPORTS COMPLEX PARKING AREAS.

E. TEMPORARY PERIMETER AND PROTECTIVE FENCING SHALL CONSIST OF 6' HT. MINIMUM CHAIN LINK FENCING WIRED TO MIN. 1-1/2" STEEL POSTS DRIVEN A MINIMUM OF 24" BELOW GRADE. WHERE FENCING IS OVER HARD SURFACING CONTRACTOR IS PERMITTED TO USE FENCING POSTS WITH WEIGHTED BASE. CONTRACTOR TO MAINTAIN THE FENCE IN-PLACE DURING CONSTRUCTION. COORDINATE EXACT LOCATIONS OF GATES WITH OWNER AND REVIEW ANY REVISIONS OR CHANGES TO THE FENCING CONFIGURATION WITH THE ENGINEER AND OWNER PRIOR TO RELOCATION.

F. ANY DAMAGE TO EXISTING FACILITIES OUTSIDE OF CONSTRUCTION LIMITS WILL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.

G. ANY DAMAGE TO EXISTING TRAIL WITHIN CONSTRUCTION LIMITS WILL BE REPAIRED TO ORIGINAL CONDITION AT THE EXPENSE OF THE CONTRACTOR.

H. MAINTAIN ACCESS AND USE OF EXISTING SIDEWALK ALONG S. 6TH STREET.

PROJECT GENERAL NOTES

1. NOTIFY UTILITY PROVIDERS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES AND COORDINATE WITH UTILITY PROVIDERS AS NECESSARY DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR DETERMINING EXISTENCE, EXACT LOCATION, AND DEPTH OF ALL UTILITIES. PROTECT ALL UTILITY LINES AND STRUCTURES NOT SHOWN FOR REMOVAL OR MODIFICATION. ANY DAMAGES TO UTILITY ITEMS NOT SHOWN FOR REMOVAL OR MODIFICATION SHALL BE REPAIRED TO THE UTILITY OWNER'S SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE.
2. CONSTRUCTION OF ALL STREET AND UTILITY IMPROVEMENTS SHALL CONFORM TO THE URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND THE SOILS REPORTS PREPARED BY OTHERS.
3. LENGTH OF UTILITIES SHOWN ON PLANS ARE DIMENSIONED FROM CENTERLINE OF STRUCTURE TO CENTERLINE OF STRUCTURE.
4. ALL TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). WHEN CONSTRUCTION ACTIVITIES OBSTRUCT PORTIONS OF THE ROADWAY, FLAGGERS SHALL BE PROVIDED. FLAGGERS SHALL CONFORM TO THE MUTCD IN APPEARANCE, EQUIPMENT AND ACTIONS.
5. NOTIFY OWNER, ENGINEER, AND CITY AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
6. CONSTRUCT MANHOLES AND APPURTENANCES AS WORK PROGRESSES. BACKFILL WITH SUITABLE MATERIAL AND COMPACT TO 95% MAXIMUM DENSITY.
7. IN THE EVENT OF A DISCREPANCY BETWEEN THE QUANTITY ESTIMATES AND THE DETAILED PLANS, THE DETAILED PLANS SHALL GOVERN.
8. ALL FIELD TILES ENCOUNTERED DURING CONSTRUCTION SHALL BE RECONNECTED AND NOTED ACCORDINGLY ON THE AS-BUILT DOCUMENTS.
9. DIMENSIONS, BUILDING LOCATION, UTILITIES AND GRADING OF THIS SITE ARE BASED ON AVAILABLE INFORMATION AT THE TIME OF DESIGN. DEVIATIONS MAY BE NECESSARY IN THE FIELD. ANY SUCH CHANGES OR CONFLICTS BETWEEN THIS PLAN AND FIELD CONDITIONS ARE TO BE REPORTED TO THE ENGINEER PRIOR TO STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT VERIFICATION OF ALL SITE IMPROVEMENTS PRIOR TO CONSTRUCTION.
10. CONTRACTOR TO LOAD AND TRANSPORT ALL MATERIALS CONSIDERED TO BE UNDESIRABLE TO BE INCORPORATED INTO THE PROJECT TO AN APPROVED OFF-SITE WASTE SITE.
11. CONTRACTOR TO STRIP AND STOCKPILE TOPSOIL FROM ALL AREAS TO BE CUT OR FILLED. RESPREAD TO MINIMUM 6" DEPTH TO FINISH GRADES.
12. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS SHOWN ARE FINISHED GRADES AND/OR TOP OF PAVING SLAB (GUTTER), UNLESS OTHERWISE NOTED.
13. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING DIRT AND DEBRIS FROM NEIGHBORING STREETS, DRIVEWAYS, AND SIDEWALKS CAUSED BY CONSTRUCTION ACTIVITIES IN A TIMELY MANNER.
14. THE ADJUSTMENT OF ANY EXISTING UTILITY APPURTENANCES TO FINAL GRADE IS CONSIDERED INCIDENTAL TO THE SITE WORK.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING EROSION CONTROL MEASURES AS NECESSARY. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING ANY EXISTING EROSION CONTROL MEASURES ON SITE AT THE TIME OF CONSTRUCTION. GRADING AND SOIL EROSION CONTROL CODE REQUIREMENTS SHALL BE MET BY CONTRACTOR. A GRADING PERMIT IS REQUIRED FOR THIS PROJECT.
16. CONTRACTOR TO COORDINATE NATURAL GAS, ELECTRICAL, TELEPHONE AND ANY OTHER FRANCHISE UTILITY SERVICES WITH UTILITY SERVICE PROVIDER, CITY, COUNTY, AND THE OWNER PRIOR TO CONSTRUCTION.
17. CONTRACTOR TO VERIFY ALL UTILITY CROSSINGS AND MAINTAIN MINIMUM 18" VERTICAL AND HORIZONTAL CLEARANCE BETWEEN UTILITIES. CONTRACTOR TO COORDINATE UTILITY ROUTING TO BUILDING AND VERIFY CONNECTION LOCATIONS AND INVERTS PRIOR TO CONSTRUCTION.

LEGEND

1,180 LF OF CHAIN LINK CONSTRUCTION FENCE

N

0 30
FEET

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = 30'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01

Sheet C003

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

STAGING PLAN AND GENERAL NOTES

SNYDER & ASSOCIATES, INC.
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SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C003

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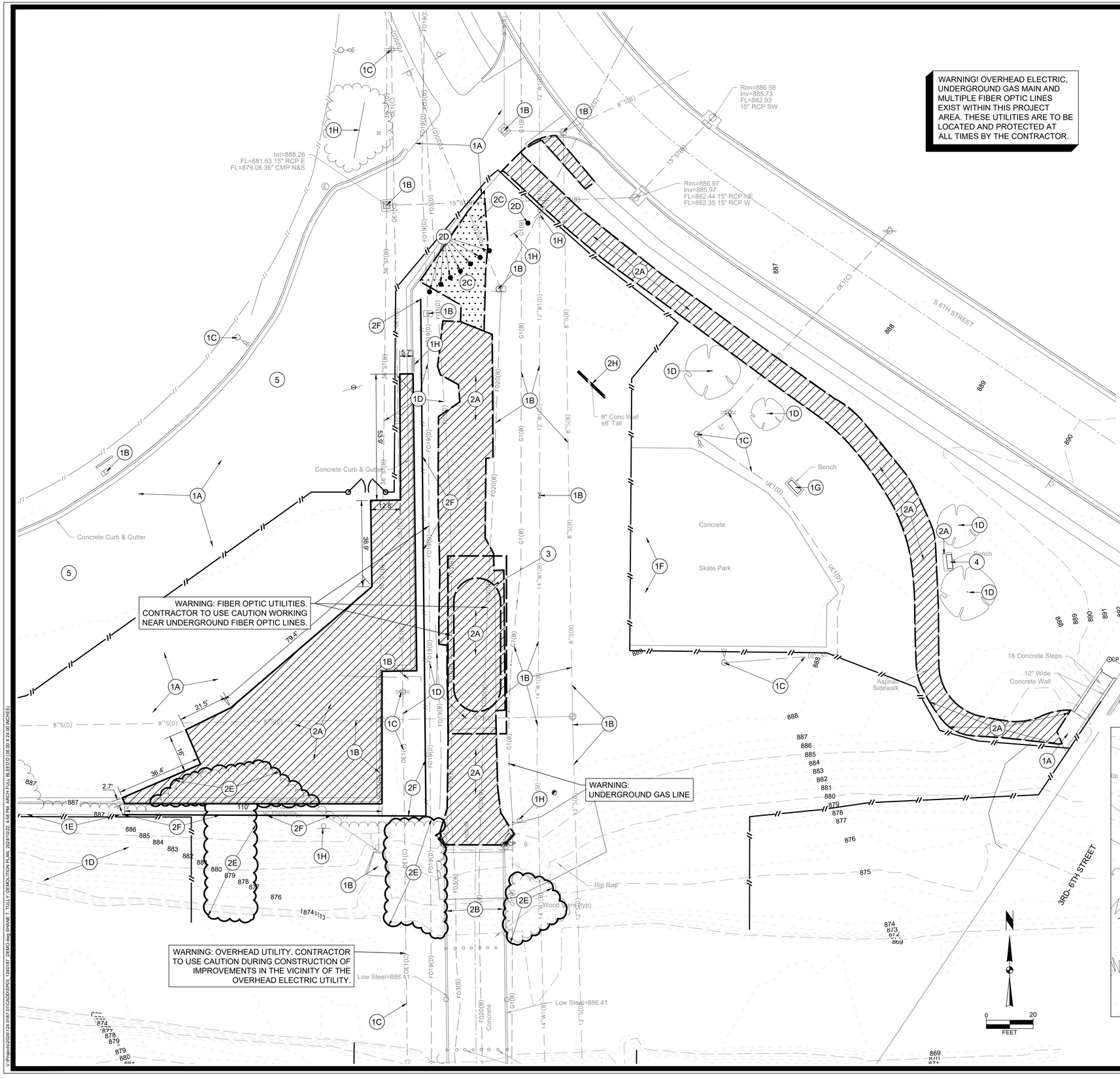


DEMOLITION PLAN NOTES

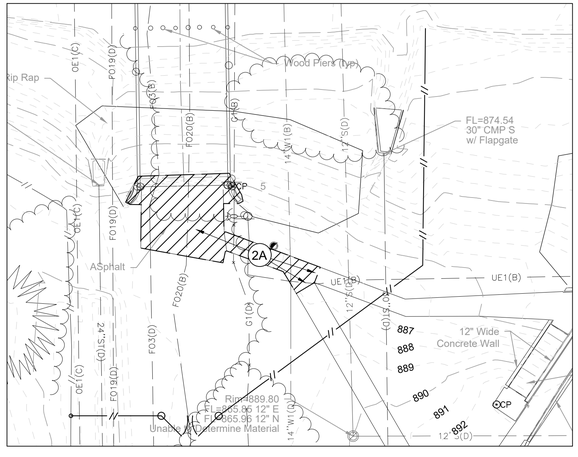
DEMOLITION CONSTRUCTION NOTES:

1. PROTECT THE FOLLOWING EXISTING FEATURES. ANY DAMAGE TO THE FOLLOWING SHALL BE REPAIRED TO THE OWNER'S SPECIFICATIONS AT THE CONTRACTOR'S COST.
   A. PAVEMENT.
   B. UNDERGROUND UTILITY AND APPURTENANCE.
   C. OVERHEAD ELECTRIC UTILITY AND CORRESPONDING POLES AND SUPPORT WIRING.
   D. PLANT MATERIAL/TREES. PROTECT TO DRIP LINE PERIMETER WITH ORANGE CONSTRUCTION FENCE TO LIMITS SHOWN.
   E. FENCE.
   F. SKATE PARK AND EQUIPMENT.
   G. BENCH AND CONCRETE PAD.
   H. SIGNAGE.
2. REMOVALS. REMOVE AND DISPOSE OF THE FOLLOWING ITEMS IN AN APPROVED OFF-SITE LOCATION.
   A. PAVEMENT. REMOVE TO NEAREST JOINT. SAW CUT REMOVAL LIMITS TO FULL DEPTH. MARK LIMITS IN FIELD FOR ENGINEER'S APPROVAL PRIOR TO DEMOLITION.
   B. BRIDGE. REFERENCE SHEET V.1 FOR ADDITIONAL BRIDGE DEMOLITION INFORMATION.
   C. GRANULAR BASE. REMOVE TO FULL DEPTH ALONG WITH ANY UNDERLAYMENT. DISPOSE OFF-SITE.
   D. WOODEN POSTS AND FOOTINGS.
   E. TREES AND PLANT MATERIAL. REMOVE STUMPS TO A MINIMUM 2' DEPTH.
   F. FENCE AND FOOTINGS. REMOVE EXISTING GALVANIZED CHAIN LINK FENCING AND SALVAGE FOR REUSE.
   G. TRAFFIC SIGN.
   H. ART WALL AND FOOTING.
3. CITY TO REMOVE PUMP TRACK AND SKATE ELEMENTS LOCATED IN THE OLD STREET AREA PRIOR TO CONSTRUCTION. CONTRACTOR TO REMOVE EXISTING PAVEMENT IN THIS AREA AFTER SKATE EQUIPMENT REMOVAL.
4. SALVAGE AND PROTECT BENCH AND DELIVER TO CITY.
5. REMOVE EXISTING PAVEMENT MARKINGS IN AREAS TO BE RE-STRIPED.
6. COORDINATE FRANCHISE UTILITY REROUTING OF THE UTILITIES ASSOCIATED WITH THE BRIDGE WITH THE CITY AND UTILITY PROVIDERS (BLUEBIRD AND WINDSTREAM).

LEGEND

REMOVAL OF PAVEMENT TO FULL DEPTH. SAW CUT AT DEMOLITION LIMITS. MATCH PAVEMENT REMOVAL LIMIT TO NEAREST JOINT.

REMOVAL OF GRANULAR SURFACE AND ANY UNDERLAYMENT. REMOVE AND DISPOSE OFF SITE.



SOUTH BRIDGE SIDEWALK AREA
SCALE: 1"=20'

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = 20'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01

Sheet C100

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

DEMOLITION PLAN

SNYDER & ASSOCIATES, INC.
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515-964-2020 | www.snyder-associates.com

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Project No: 124.0187.01
Sheet C100

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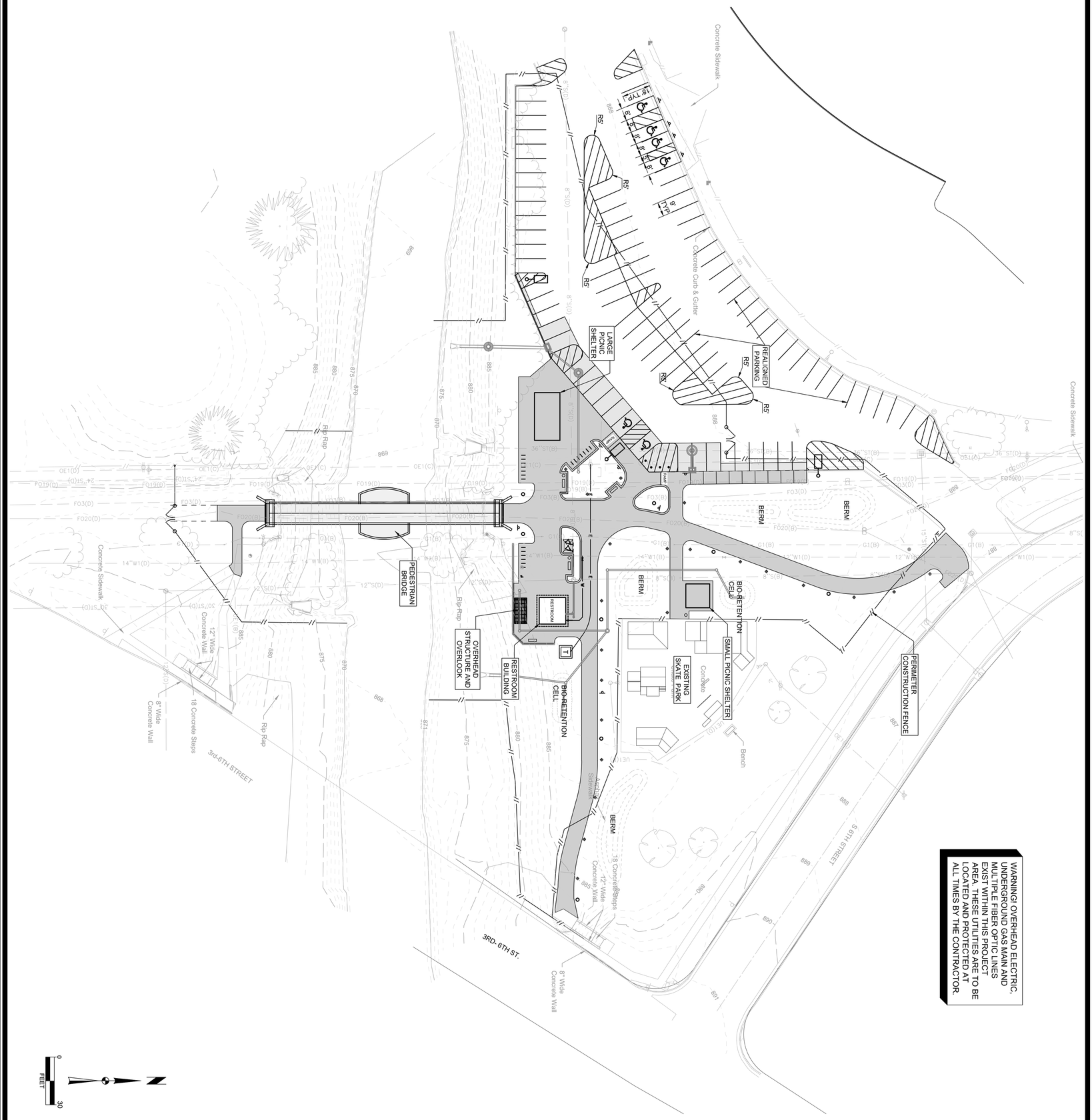


SNYDER & ASSOCIATES

LINN CREEK TRAILHEAD

OVERALL SITE LAYOUT PLAN

MARSHALLTOWN, IOWA

SNYDER & ASSOCIATES, INC.

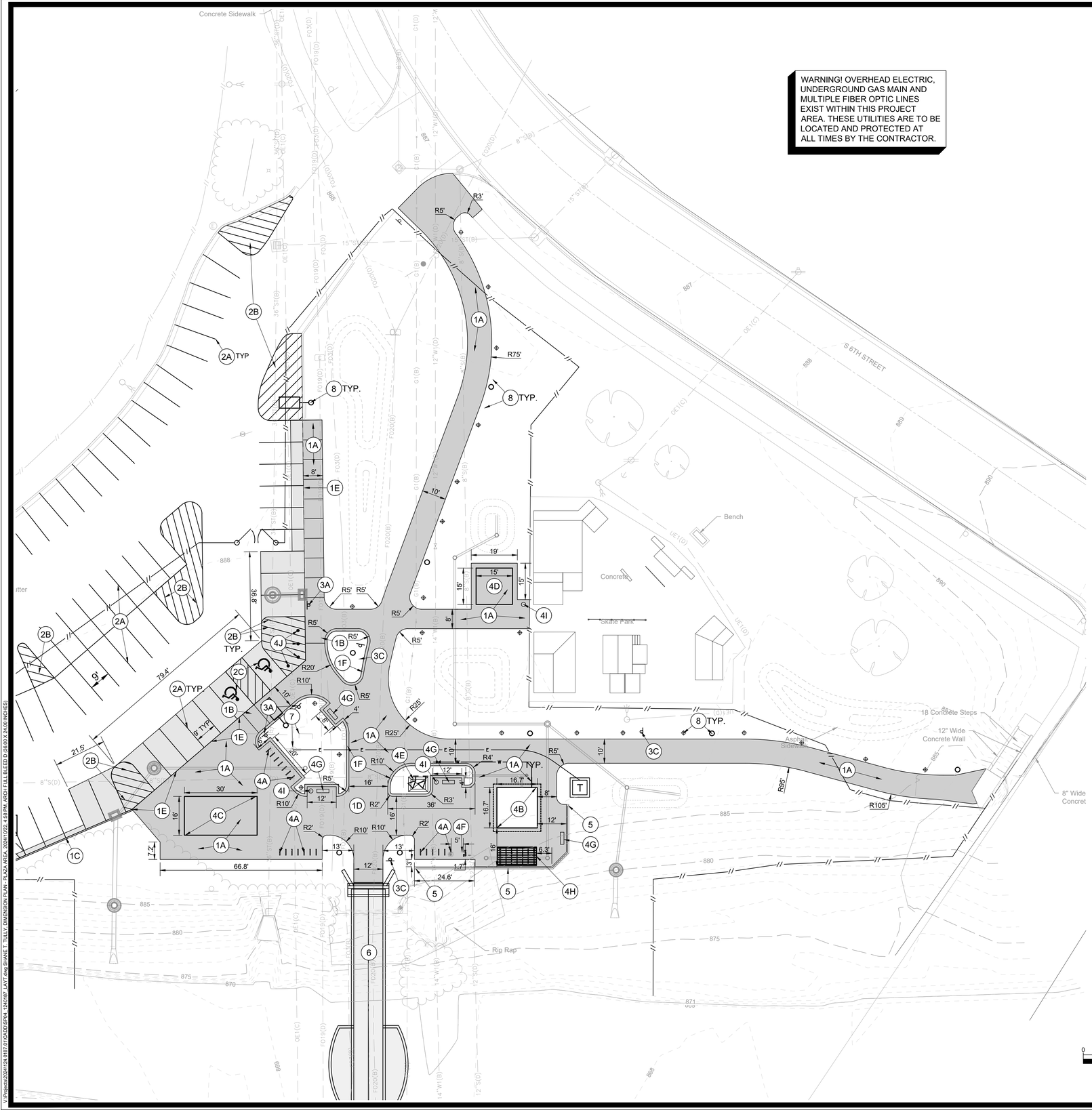
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

MARK	REVISION	DATE	BY

Engineer: RMV	Checked By: TLW	Scale: 1" = 30'
Technician: TKV	Date: 10/22/2024	T-R-S: TTN-RRW-SS
Project No: 124.0187.01		Sheet C200

Project No: 124.0187.01

Sheet C200



WARNING! OVERHEAD ELECTRIC, UNDERGROUND GAS MAIN AND MULTIPLE FIBER OPTIC LINES EXIST WITHIN THIS PROJECT AREA. THESE UTILITIES ARE TO BE LOCATED AND PROTECTED AT ALL TIMES BY THE CONTRACTOR.

LAYOUT AND DIMENSION CONSTRUCTION NOTES:

1. PAVEMENT. PROVIDE AND INSTALL THE FOLLOWING:
   A. 6" DEPTH PCC PAVEMENT ON 4" DEPTH GRANULAR BASE.
   B. PEDESTRIAN RAMP, MAXIMUM 8.33% SLOPE, WITH DETECTABLE WARNING PANELS.
   C. 6" PCC CURB, INTEGRAL TO ADJACENT PAVEMENT.
   D. SPECIAL JOINTING PATTERN IN PLAZA AREA. SEE JOINTING PLAN.
   E. PCC INTEGRAL CURB & SIDEWALK. SEE SITE DETAILS SHEET.
   F. 4" SLOPED CURB. SEE SITE DETAILS SHEET.

2. PAVEMENT MARKINGS. PROVIDE AND INSTALL THE FOLLOWING:
   A. 4" WIDE WHITE LINE.
   B. 4" WIDE STRIPING, 3' O.C. ON 45-DEGREE ANGLE.
   C. ACCESSIBLE PARKING SYMBOL, AS PER ADAAG REQUIREMENTS.

3. SIGNAGE. PROVIDE AND INSTALL THE FOLLOWING:
   A. ACCESSIBLE PARKING SIGN WITH VAN ACCESSIBLE SIGN MOUNTED TO A 2" ALUMINUM-ROUND POST WITH BRACKETS ON A CONCRETE FOOTING, AS PER ADAAG REQUIREMENTS.
   B. "NO PARKING" SIGN MOUNTED TO 2" ALUMINUM-ROUND POST WITH BRACKETS ON A CONCRETE FOOTING.
   C. TRAIL WAYFINDING SIGNAGE. SEE SITE DETAILS SHEET.

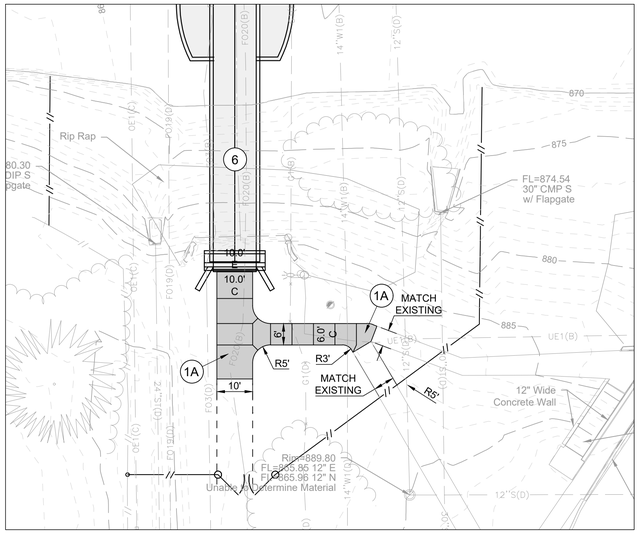
4. SITE AMENITIES. PROVIDE AND INSTALL THE FOLLOWING:
   A. BIKE RACKS. POWDER COATED MATTE BLACK. SURFACE MOUNTED . SEE SITE DETAILS SHEET.
   B. RESTROOM BUILDING. SEE RESTROOM DETAILS SHEET.
   C. LARGE SHELTER. SEE RESTROOM DETAILS SHEET.
   D. SMALL SHELTER. SEE SHELTER DETAILS SHEET.
   E. PARK SIGN. SEE SITE DETAILS SHEET.
   F. BIKE FIX-IT STATION. SEE DETAILS.
   G. BENCH. SEE SITE DETAILS SHEET.
   H. OVERHEAD STRUCTURE. SEE SHELTER DETAILS SHEET.
   I. TRASH RECEPTACLE. SEE SITE DETAILS SHEET.
   J. BOLLARD. SEE SITE DETAILS SHEET.

5. CONCRETE RETAINING WALL AND RAILING. SEE DETAIL.

6. PEDESTRIAN BRIDGE. REFER TO PEDESTRIAN BRIDGE SHEETS FOR ADDITIONAL INFORMATION.

7. EXISTING ELECTRIC POLE, OVERHEAD UTILITY AND ABOVE GRADE ELECTRICAL JUNCTION BOX. USE CAUTION WHEN WORKING ADJACENT TO THESE STRUCTURES. PROTECT DURING CONSTRUCTION.

8. PROPOSED SITE LIGHTING. REFER TO SITE ELECTRICAL PLAN FOR ADDITIONAL INFORMATION.



SOUTH BRIDGE SIDEWALK AREA
SCALE: 1"=20'

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01

Sheet C201

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

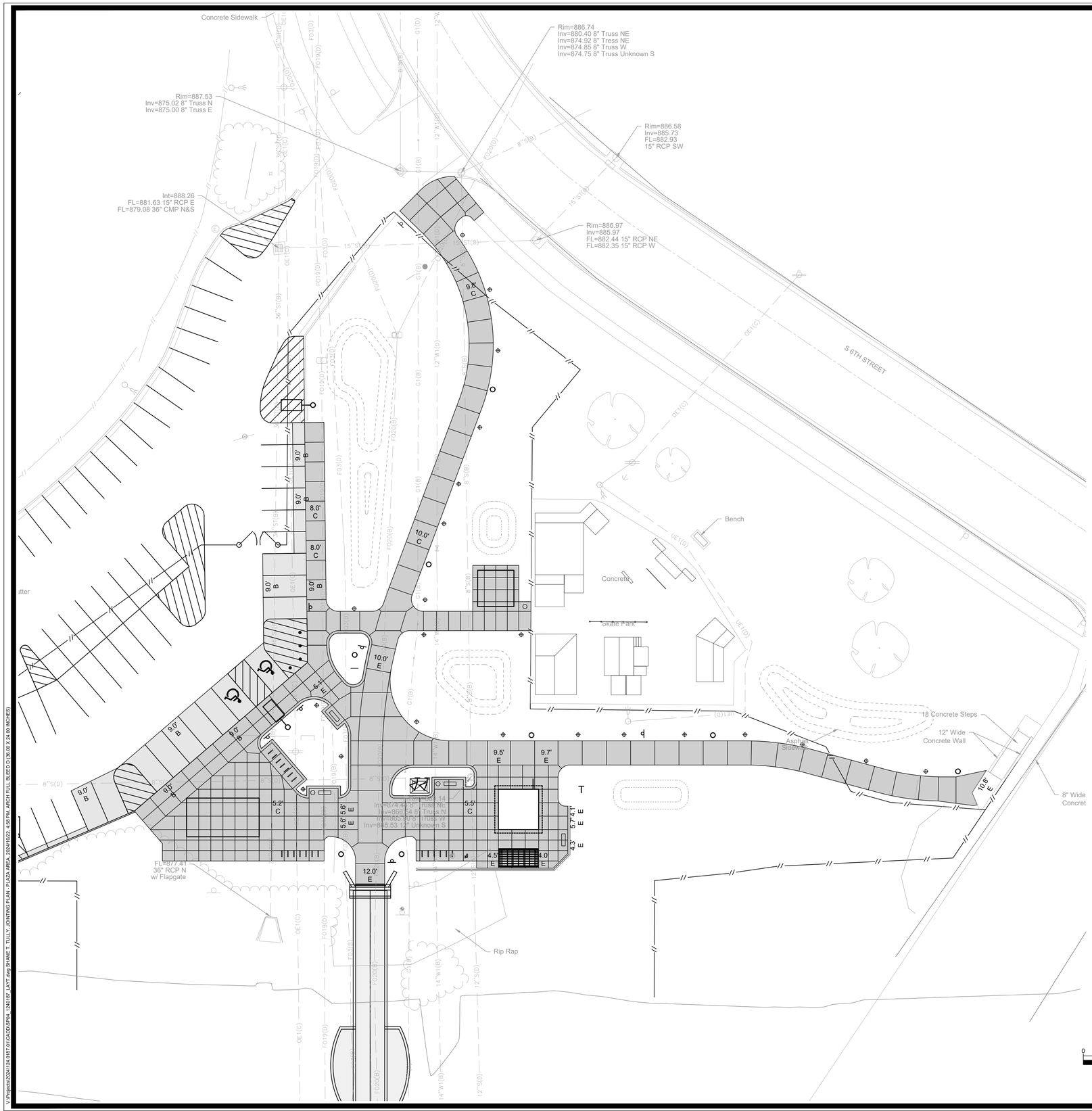
DIMENSION PLAN - PLAZA AREA

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C201

V:\Projects\2024\124.0187.01\CAD\SBR04_124018F1_LAYT.dwg SHANE T. TULLY, DIMENSION PLAN - PLAZA AREA, 2024/10/22, 4:38 PM, ARCH FULL ELEED D (36.00 X 24.00 INCHES)



JOINTING PLAN NOTES:

A. CONTRACTOR TO PROVIDE JOINTING PLAN IDENTIFYING JOINT TYPES AND DIMENSIONS FOR ENGINEER REVIEW PRIOR TO CONSTRUCTION,

B. VERIFY LAYOUT OF EXISTING PAVEMENT JOINTS TO ENSURE ALIGNMENT WITH PROPOSED JOINTS.

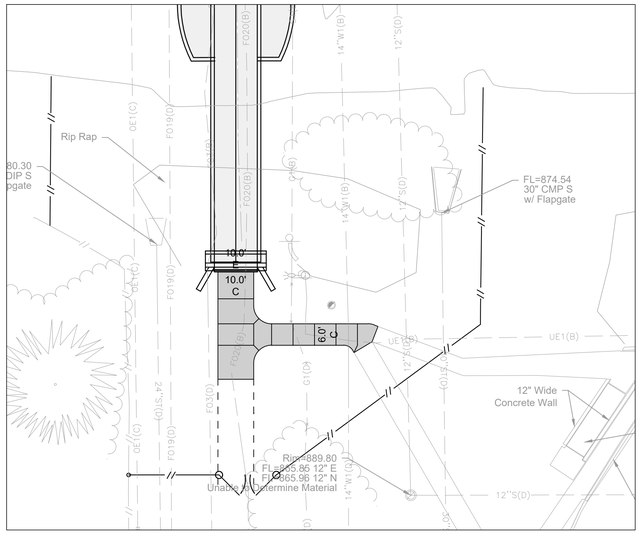
C. JOINTING SHALL BE IN ACCORDANCE WITH CURRENT SUDAS STANDARDS.

D. CONTRACTOR TO PROVIDE "B"/"BT" JOINT WHERE PAVEMENT ABUTS EXISTING PAVEMENTS

E. PROVIDE EXPANSION JOINT AT BUILDING FACE AND WHERE PAVEMENTS ABUT FOUNDATIONS AND FOOTINGS (I.E. DOCK WALLS, SEAT WALLS, FROST FOOTING STOOPS).

LEGEND

E - EXPANSION, SEALED
C - SAW CUT CONTROL JOINT, 1-1/2 MIN DEPTH
B - END OF DAY BUTT JOINT



SOUTH BRIDGE SIDEWALK AREA
SCALE: 1"=20'

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ###
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01

Sheet C202

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

JOINTING PLAN - PLAZA AREA

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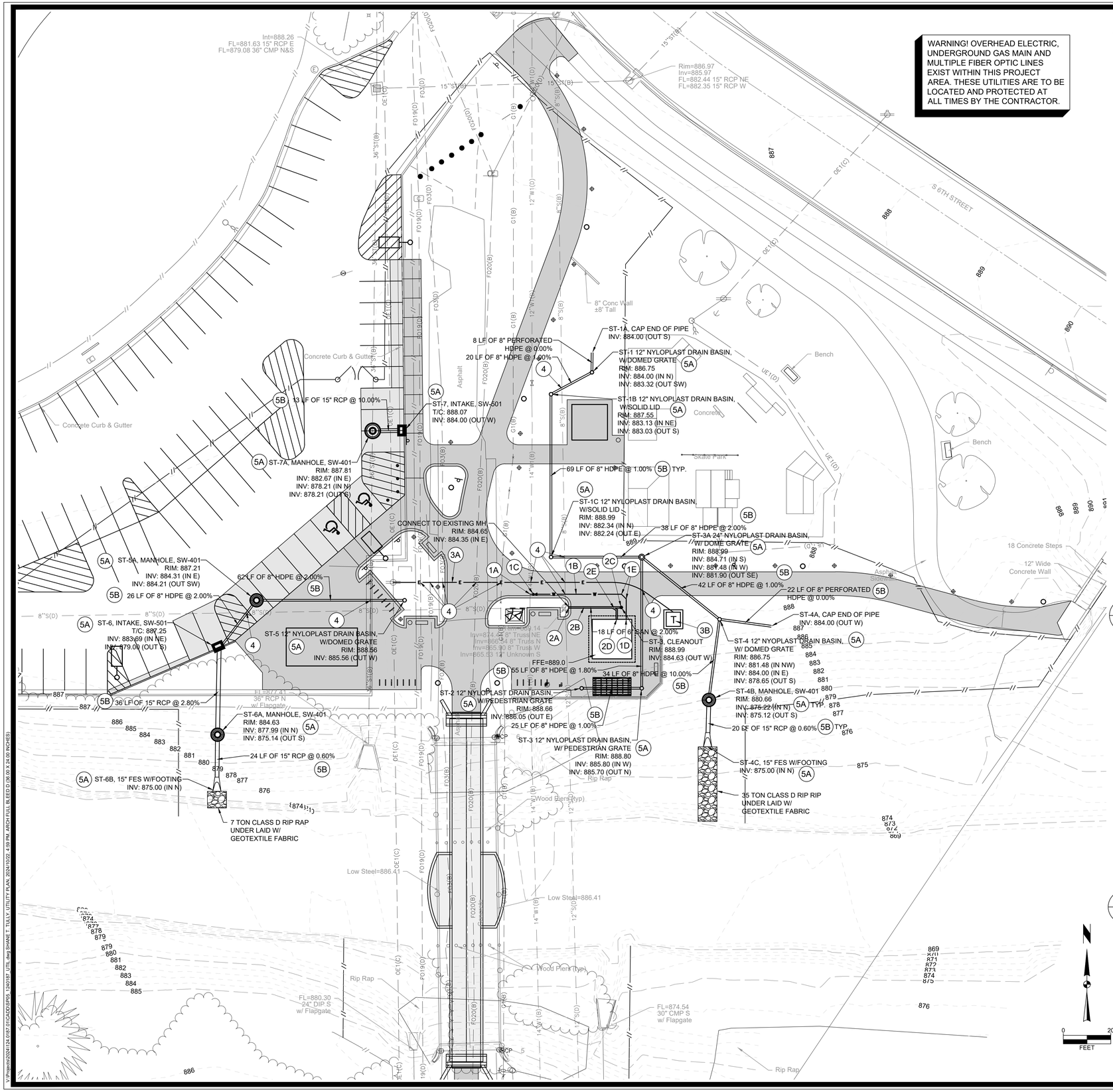
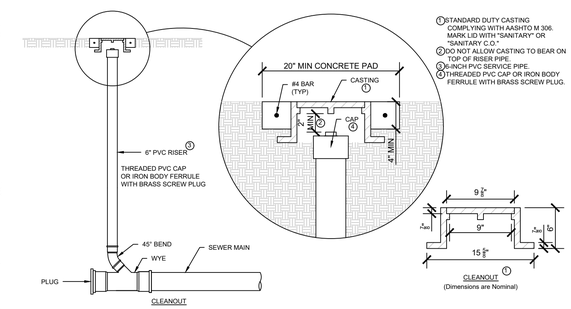
Project No: 124.0187.01
Sheet C202

V:\Projects\2024\124.0187.01\CAD\SHP04_P240187_LAYT.dwg SHANE T. TULLY - JOINTING PLAN - PLAZA AREA - 2024/10/22 4:59 PM, ARCH FULL BLEED D (36.00 X 24.00 INCHES)



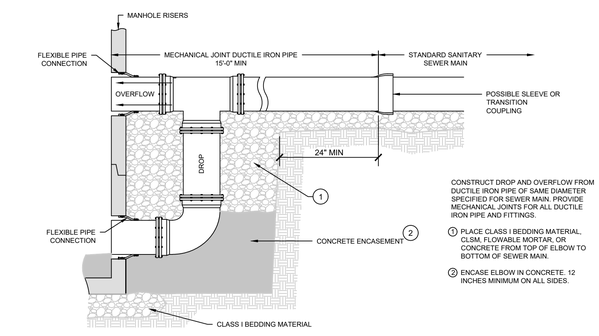
UTILITY PLAN CONSTRUCTION NOTES

1. WATER SERVICES. PROVIDE THE FOLLOWING:
   A. CONNECT TO EXISTING 14" WATER MAIN WITH TAPPING SLEEVE AND VALVE. COORDINATE CONNECTION WITH THE CITY OF MARSHALLTOWN WATER DEPARTMENT.
   B. 2" WATER SERVICE AT MINIMUM 5' BURY DEPTH. PROVIDE TRACER WIRE IF PLASTIC WATER SERVICE IS INSTALLED. CONFIRM WITH MECHANICAL PLANS FOR SIZE, LOCATION AND ELEVATION TO ENTER THE BUILDING.
   C. 2" DOMESTIC SERVICE AND VALVE.
   D. CONNECT TO PROPOSED BUILDING SERVICE. CONFIRM WITH MECHANICAL PLANS FOR SIZE. LOCATION AND ELEVATION.
   E. 45 DEGREE BEND.
2. SANITARY SEWER SERVICES. PROVIDE THE FOLLOWING:
   A. CONNECT TO EXISTING 12" SANITARY SEWER WITH DROP SERVICE MANHOLE. VERIFY LOCATION AND ELEVATION PRIOR TO CONSTRUCTION. SEE DETAIL THIS SHEET.
   B. 6" SANITARY SEWER SERVICE LINE AT 2.0% MINIMUM SLOPE (¼" PER FOOT).
   C. SANITARY CLEANOUT. SEE DETAIL THIS SHEET.
   D. CONNECT TO PROPOSED BUILDING SERVICE. CONFIRM WITH MECHANICAL PLANS FOR SIZE. LOCATION AND ELEVATION.
   E. Y CONNECTION.
3. SITE UTILITIES. COORDINATE UTILITY SERVICES WITH LOCAL PROVIDERS AND ARCHITECTURAL AND MECHANICAL PLANS.
   A. ELECTRICAL SERVICE. COORDINATE EXACT LOCATION WITH OWNER AND FRANCHISE UTILITY OWNER PRIOR TO CONSTRUCTION. SEE ELECTRICAL PLANS.
   B. ELECTRICAL TRANSFORMER AND SERVICE. COORDINATE EXACT LOCATION WITH ARCHITECTURAL AND MECHANICAL PLANS FOR DETAILS.
   C. SITE LIGHTING. SEE ELECTRICAL PLANS.
4. CRITICAL CROSSING. MAINTAIN MINIMUM 18" SEPARATION BETWEEN ALL OTHER UTILITIES. VERIFY PRIOR TO CONSTRUCTION.
5. STORM SEWER IMPROVEMENTS, PROVIDE THE FOLLOWING.
   A. STRUCTURE.
   B. PIPE.



1 / C300 SANITARY SEWER CLEANOUT

NO SCALE



2 / C300 EXTERNAL DROP CONNECTION FOR SANITARY SEWER MANHOLE (SW-301) DETAIL

NO SCALE

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C300

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

UTILITY PLAN

SNYDER & ASSOCIATES, INC.
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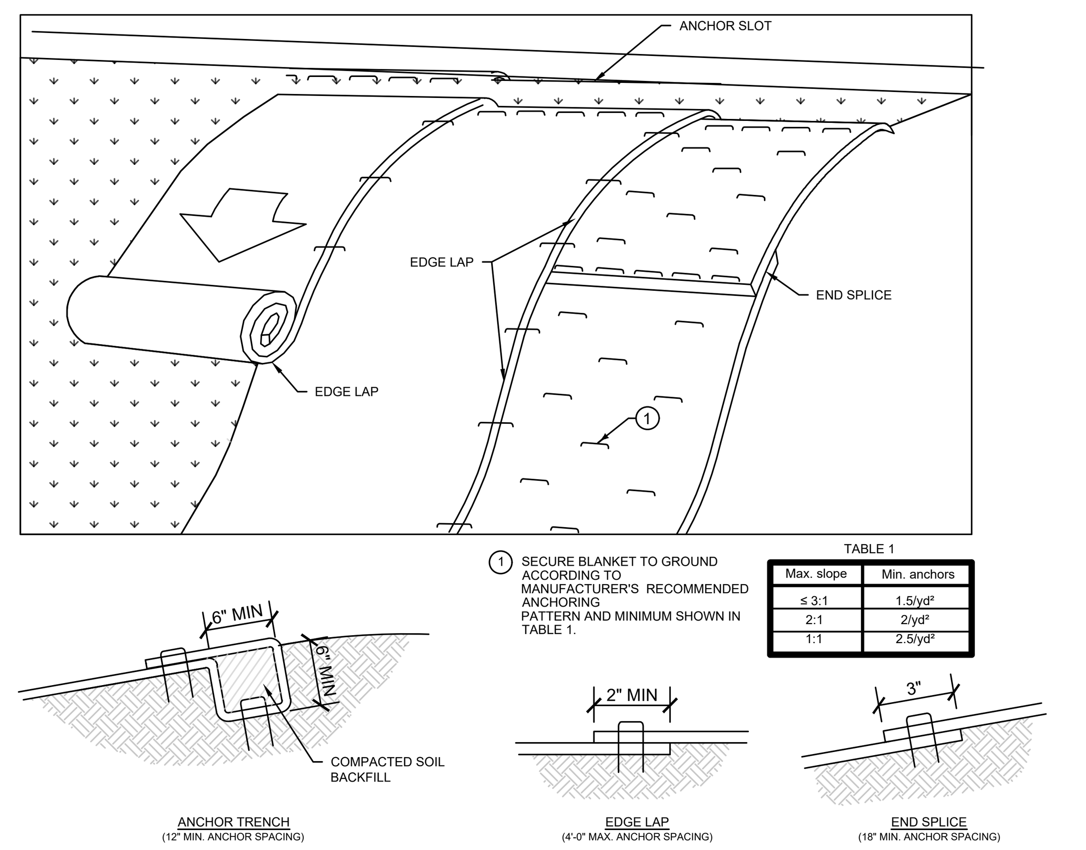
Project No: 124.0187.01
Sheet C300

V:\Projects\2024\124.0187.01\CAD\SDP\5_124.0187_UTIL.dwg SHANE T. TOLLY, UTILITY PLAN, 2024/10/22 4:59 PM, ARCH FULL BLEED D (36.00 X 24.00 INCHES)



① SECURE BLANKET TO GROUND ACCORDING TO MANUFACTURER'S RECOMMENDED ANCHORING PATTERN AND MINIMUM SHOWN IN TABLE 1.

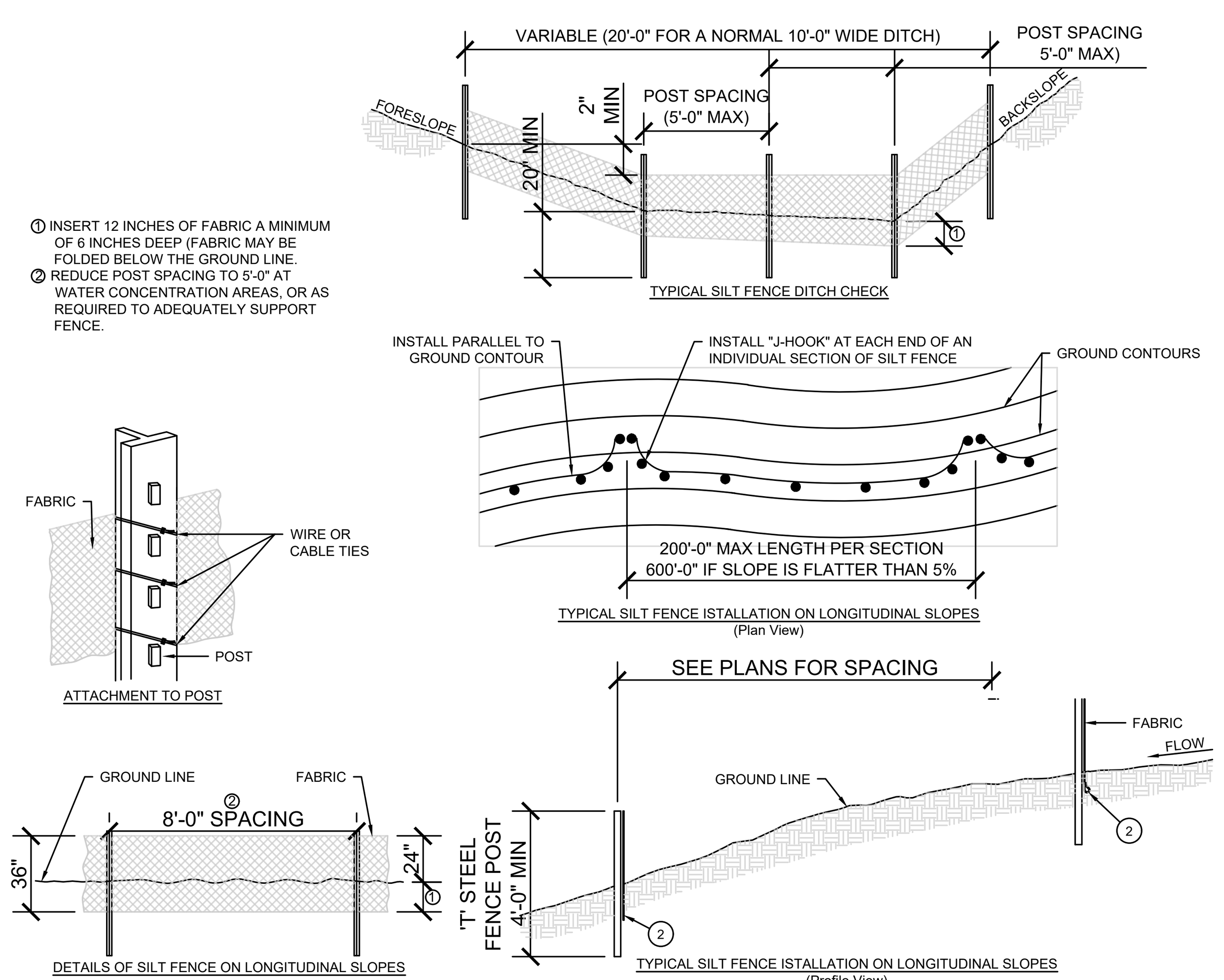
TABLE 1

Max. slope	Min. anchors
≤ 3:1	1.5/yd²
2:1	2/yd²
1:1	2.5/yd²

1 / C400 — ROLLED EROSION CONTROL PRODUCT (RECP) INSTALLATION ON SLOPES

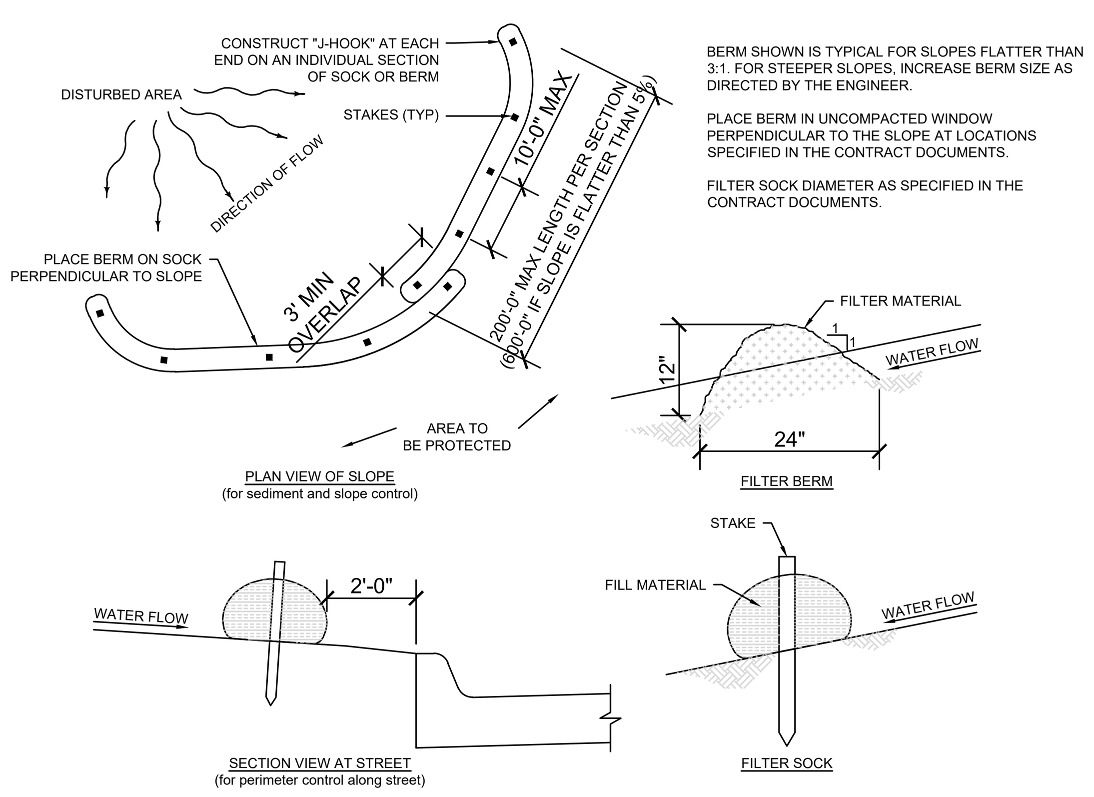
NO SCALE

① INSERT 12 INCHES OF FABRIC A MINIMUM OF 6 INCHES DEEP (FABRIC MAY BE FOLDED BELOW THE GROUND LINE.
② REDUCE POST SPACING TO 5'-0" AT WATER CONCENTRATION AREAS, OR AS REQUIRED TO ADEQUATELY SUPPORT FENCE.



2 / C400 — SILT FENCE DETAIL

NO SCALE



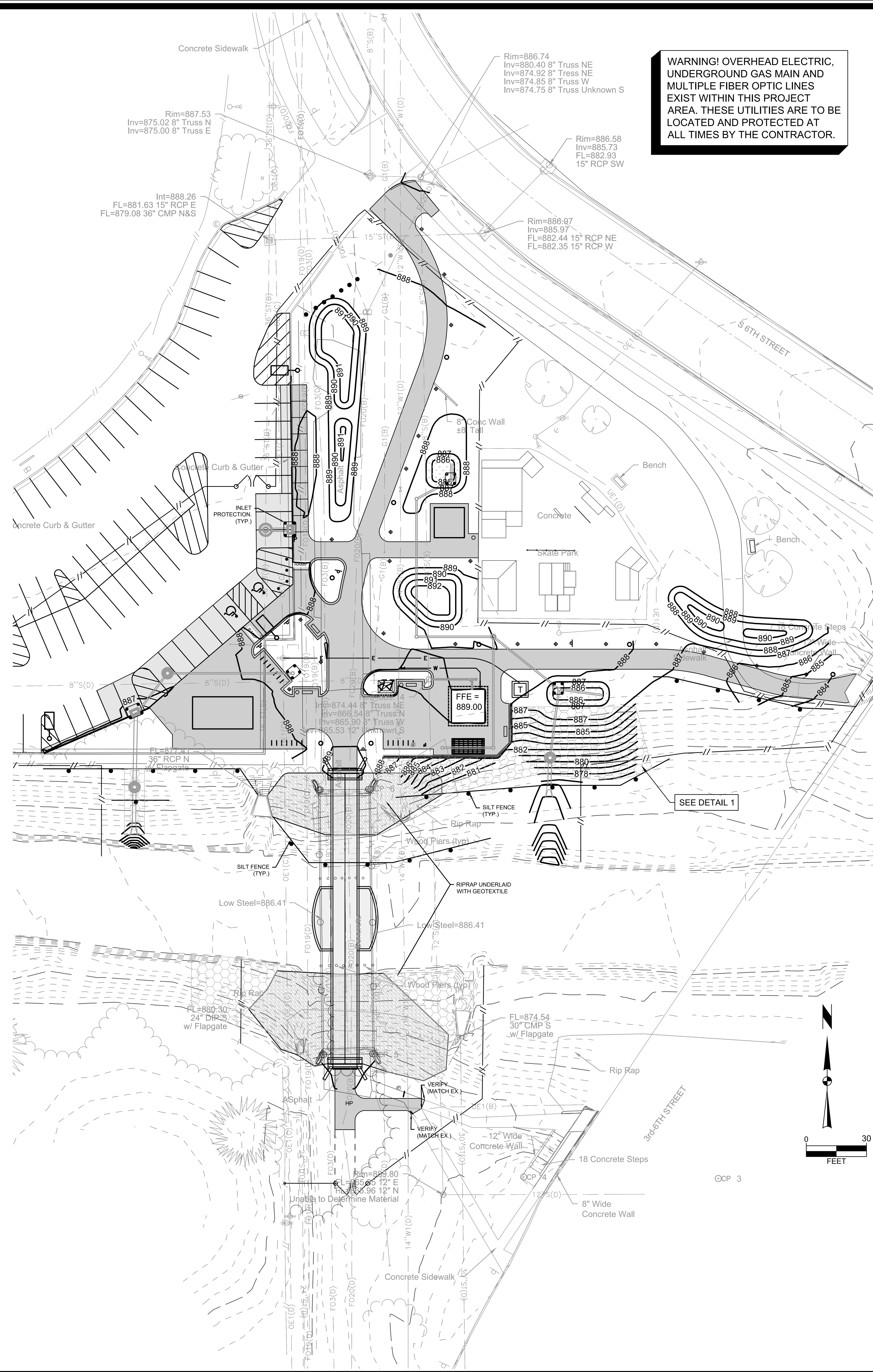
BERM SHOWN IS TYPICAL FOR SLOPES FLATTER THAN 3:1. FOR STEEPER SLOPES, INCREASE BERM SIZE AS DIRECTED BY THE ENGINEER.

PLACE BERM IN UNCOMPACTED WINDOW PERPENDICULAR TO THE SLOPE AT LOCATIONS SPECIFIED IN THE CONTRACT DOCUMENTS.

FILTER SOCK DIAMETER AS SPECIFIED IN THE CONTRACT DOCUMENTS.

3 / C400 — FILTER SOCK DETAIL

NO SCALE



WARNING! OVERHEAD ELECTRIC, UNDERGROUND GAS MAIN AND MULTIPLE FIBER OPTIC LINES EXIST WITHIN THIS PROJECT AREA. THESE UTILITIES ARE TO BE LOCATED AND PROTECTED AT ALL TIMES BY THE CONTRACTOR.

GRADING GENERAL NOTES

A. CONTRACTOR TO STRIP AND STOCKPILE TOPSOIL ON ALL AREAS TO BE CUT OR FILLED. RESPREAD TO MINIMUM 6" DEPTH TO FINISH GRADES.

B. ANY EXCESS CUT TO BE HAULED OFF SITE. OWNER RETAINS FIRST RIGHT OF REFUSAL OF EXCESS SOILS.

C. PROVIDE BELOW GRADE INLET PROTECTION IN PAVED AREAS FOLLOWING PAVING OPERATIONS.

POLLUTION PREVENTION NOTES

A. POLLUTION PREVENTION AND EROSION PROTECTION

1. CODE COMPLIANCE: THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL POTENTIAL POLLUTION AND SOIL EROSION CONTROL REQUIREMENTS OF THE IOWA CODE, THE IOWA DEPARTMENT OF NATURAL RESOURCES (IDNR) NPDES PERMIT, THE U.S. CLEAN WATER ACT AND ANY LOCAL ORDINANCES. THE CONTRACTOR SHALL TAKE ALL NECESSARY STEPS TO PROTECT AGAINST EROSION AND POLLUTION FROM THIS PROJECT SITE AND ALL OFF-SITE BORROW OR DEPOSIT AREAS DURING PERFORMANCE OR AS A RESULT OF PERFORMANCE.
2. CONTRACTOR TO REFER TO SPECIAL PREVISION NO. 1: POLLUTION PREVENTION PLAN SECTION IN THE SPECIFICATIONS FOR GENERAL REQUIREMENTS
3. DAMAGE CLAIMS: THE CONTRACTOR WILL HOLD THE OWNER AND ARCHITECT / ENGINEER HARMLESS FROM ANY AND ALL CLAIMS OF ANY TYPE WHATSOEVER RESULTING FROM DAMAGES TO ADJOINING PUBLIC OR PRIVATE PROPERTY, INCLUDING REASONABLE ATTORNEY FEES INCURRED TO OWNER. FURTHER, IF THE CONTRACTOR FAILS TO TAKE NECESSARY STEPS TO PROMPTLY REMOVE EARTH SEDIMENTATION OR DEBRIS WHICH COMES ONTO ADJOINING PUBLIC OR PRIVATE PROPERTY, THE OWNER MAY, BUT NEED NOT, REMOVE SUCH ITEMS AND DEDUCT THE COST THEREOF FROM AMOUNTS DUE TO THE CONTRACTOR.

B. STORM WATER DISCHARGE PERMIT

1. THIS PROJECT REQUIRES COVERAGE UNDER THE NPDES GENERAL PERMIT NO. 2 FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES FROM THE IDNR, AS REQUIRED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS ARE RESPONSIBLE FOR COMPLIANCE WITH AND FULFILLMENT OF ALL REQUIREMENTS OF THE NPDES GENERAL PERMIT NO. 2 AS SPECIFIED IN THE CONTRACT DOCUMENTS.
2. ALL DOCUMENTS RELATED TO THE STORM WATER DISCHARGE PERMIT, INCLUDING, BUT NOT LIMITED TO, THE NOTICE OF INTENT, PROOF OF PUBLICATIONS, DISCHARGE AUTHORIZATION LETTER, CURRENT SWPPP, SITE INSPECTION LOG, AND OTHER ITEMS, SHALL BE KEPT ON SITE AT ALL TIMES AND MUST BE PRESENTED TO ANY JURISDICTIONAL AGENCIES UPON REQUEST. FAILURE TO COMPLY WITH THE NPDES PERMIT REQUIREMENTS IS A VIOLATION OF THE CLEAN WATER ACT AND THE CODE OF IOWA.
3. A "NOTICE OF DISCONTINUATION" MUST BE FILED WITH THE IDNR UPON FINAL STABILIZATION OF THE DISTURBED SITE AND REMOVAL OF ALL TEMPORARY EROSION CONTROL MEASURES. ALL PLANS, INSPECTION REPORTS, AND OTHER DOCUMENTS MUST BE RETAINED FOR A PERIOD OF THREE YEARS AFTER PROJECT COMPLETION. THE CONTRACTOR SHALL RETAIN A RECORD COPY AND PROVIDE THE ORIGINAL DOCUMENTS TO THE OWNER UPON PROJECT ACCEPTANCE AND/OR SUBMITTAL OF THE NOTICE OF DISCONTINUATION.

C. POLLUTION PREVENTION PLAN

1. THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IS A SEPARATE DOCUMENT IN ADDITION TO THESE PLAN DRAWINGS. THE CONTRACTOR SHOULD REFER TO THE SWPPP FOR ADDITIONAL REQUIREMENTS AND MODIFICATIONS TO THE POLLUTION PREVENTION PLAN MADE DURING CONSTRUCTION.
2. THE SWPPP ILLUSTRATES GENERAL MEASURES AND BEST MANAGEMENT PRACTICES (BMP) FOR COMPLIANCE WITH THE PROJECT'S NPDES PERMIT COVERAGE. ALL BMP'S AND EROSION CONTROL MEASURES REQUIRED AS A RESULT OF CONSTRUCTION ACTIVITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY, NOTE AND IMPLEMENT. ADDITIONAL BMP'S FROM THOSE SHOWN ON THE PLAN MAY BE REQUIRED.
3. THE SWPPP AND SITE MAP SHOULD BE EXPEDITIOUSLY REVISED TO REFLECT CONSTRUCTION PROGRESS AND CHANGES AT THE PROJECT SITE.
4. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL REQUIREMENTS OF THE GENERAL PERMIT AND SWPPP, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING BMP'S UNLESS INFEASIBLE OR NOT APPLICABLE:
   a. INSTALL PERIMETER AND FINAL SEDIMENT CONTROL MEASURES SUCH AS SILT BARRIERS, DITCH CHECKS, DIVERSION BERMS, OR SEDIMENTATION BASINS DOWNSTREAM OF SOIL DISTURBING ACTIVITIES PRIOR TO SITE CLEARING AND GRADING OPERATIONS.
   b. PRESERVE EXISTING VEGETATION IN AREAS NOT NEEDED FOR CONSTRUCTION AND LIMIT TO A MINIMUM THE TOTAL AREA DISTURBED BY CONSTRUCTION OPERATIONS AT ANY TIME.
   c. MAINTAIN ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES IN WORKING ORDER, INCLUDING CLEANING, REPAIRING, REPLACEMENT, AND SEDIMENT REMOVAL THROUGHOUT THE PERMIT PERIOD. CLEAN OR REPLACE SILT CONTROL DEVICES WHEN THE MEASURES HAVE LOST 50% OF THEIR ORIGINAL CAPACITY.
   d. INSPECT THE PROJECT AREA AND CONTROL DEVICES (BY QUALIFIED PERSONNEL ASSIGNED BY THE CONTRACTOR) EVERY SEVEN CALENDAR DAYS. RECORD THE FINDINGS OF THESE INSPECTIONS AND ANY RESULTING ACTIONS IN THE SWPPP WITH A COPY SUBMITTED WEEKLY TO THE OWNER OR ENGINEER DURING CONSTRUCTION. REVISE THE SWPPP AND IMPLEMENT ANY RECOMMENDED MEASURES WITHIN 7 DAYS.
   e. PREVENT ACCUMULATION OF EARTH AND DEBRIS FROM CONSTRUCTION ACTIVITIES ON ADJOINING PUBLIC OR PRIVATE PROPERTIES, INCLUDING STREETS, DRIVEWAYS, SIDEWALKS, DRAINAGEWAYS, OR UNDERGROUND SEWERS. REMOVE ANY ACCUMULATION OF EARTH OR DEBRIS IMMEDIATELY AND TAKE REMEDIAL ACTIONS FOR FUTURE PREVENTION.
   f. INSTALL NECESSARY CONTROL MEASURES SUCH AS SILT BARRIERS, EROSION CONTROL MATS, MULCH, DITCH CHECKS OR RIPRAP AS SOON AS AREAS REACH THEIR FINAL GRADES AND AS CONSTRUCTION OPERATIONS PROGRESS TO ENSURE CONTINUOUS RUNOFF CONTROL. PROVIDE INLET AND OUTLET CONTROL MEASURES AS SOON AS STORM SEWERS ARE INSTALLED.
   g. RESPREAD A MINIMUM OF 4 INCHES OF TOPSOIL (INCLUDING TOPSOIL FOUND IN SOD) ON ALL DISTURBED AREAS, EXCEPT WHERE PAVEMENT, BUILDINGS OR OTHER IMPROVEMENTS ARE LOCATED.
   h. STABILIZE UNDEVELOPED, DISTURBED AREAS WITH MULCH, TEMPORARY SEED MIX, PERMANENT SEED MIX, SOD, OR PAVEMENT IMMEDIATELY AS SOON AS POSSIBLE UPON COMPLETION OR DELAY OF GRADING OPERATIONS. INITIATE STABILIZATION MEASURES IMMEDIATELY AFTER CONSTRUCTION ACTIVITY IS FINALLY COMPLETED OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WHICH WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS.
   i. COORDINATE LOCATIONS OF STAGING AREAS WITH THE OWNER AND RECORD IN THE SWPPP. UNLESS NOTED OTHERWISE, STAGING AREAS SHOULD CONTAIN THE FOLLOWING: JOB TRAILERS, FUELING / VEHICLE MAINTENANCE AREA, TEMPORARY SANITARY FACILITIES, MATERIALS STORAGE, AND CONCRETE WASHOUT FACILITY. CONTROL RUNOFF FROM STAGING AREAS WITH DIVERSION BERMS AND/OR SILT BARRIERS AND DIRECT TO A SEDIMENT BASIN OR OTHER CONTROL DEVICE WHERE POSSIBLE. CONCRETE WASHOUT MUST BE CONTAINED ONSITE.
   j. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AND SITE WASTE PRIOR TO FILING OF THE "NOTICE OF DISCONTINUATION".

QUANTITIES

(silt fence symbol)	SILT FENCE = 494 LF
(inlet protection symbol)	INLET PROTECTION (SILT SOCK) AT BASIN IN LAWN/LANDSCAPE AREAS = 63 LF
(inlet protection symbol)	INLET PROTECTION BELOW GRADE-PAVEMENT AREAS = 2 EA
(RECP hatch)	RECP - TYPE 1 = 5,683 SF

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = 30'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C400

LINN CREEK TRAILHEAD

GRADING, POLLUTION PREVENTION, AND EROSION CONTROL PLAN MARSHALLTOWN, IOWA

SNYDER & ASSOCIATES, INC.
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ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

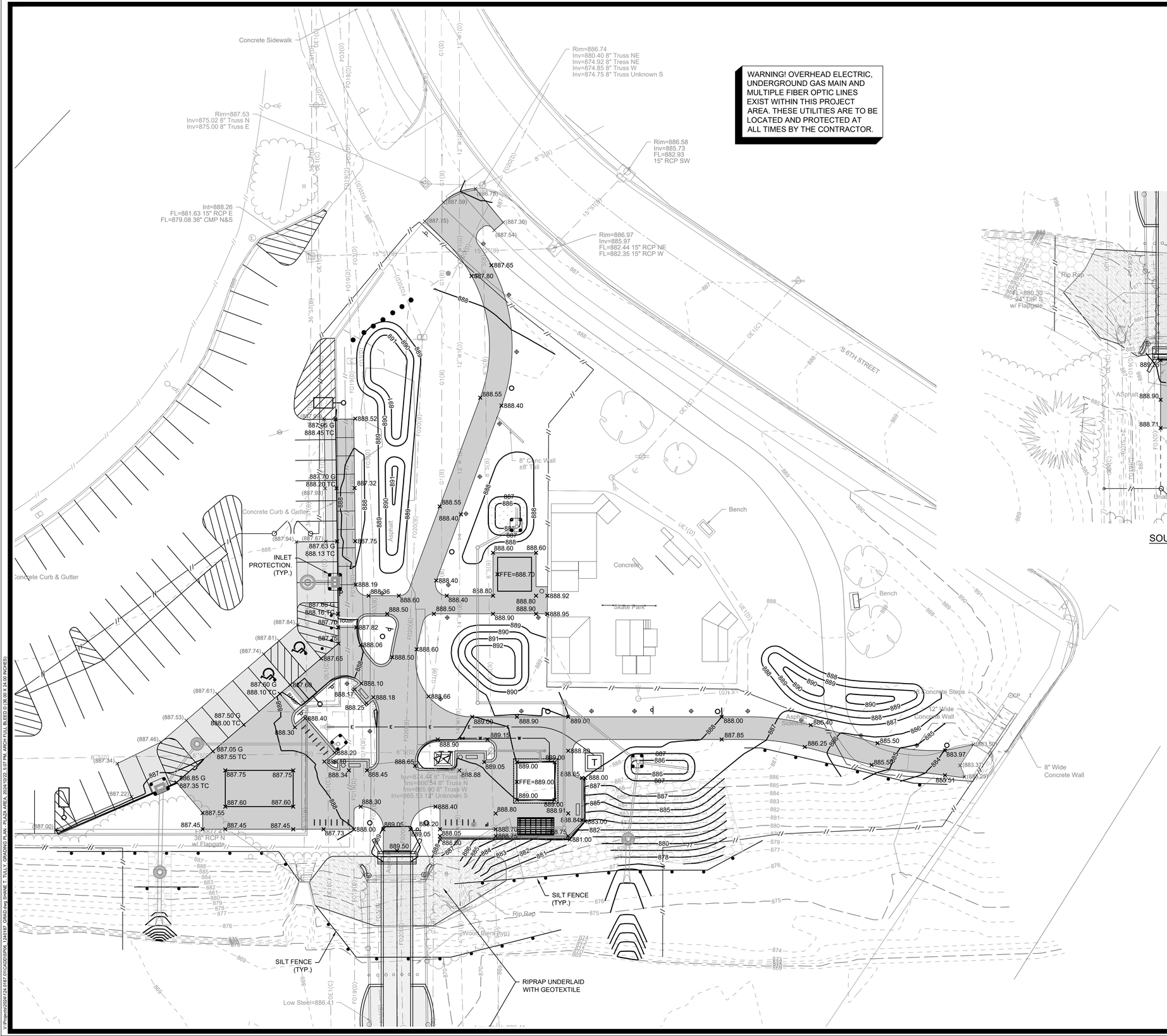
Project No: 124.0187.01
Sheet C400

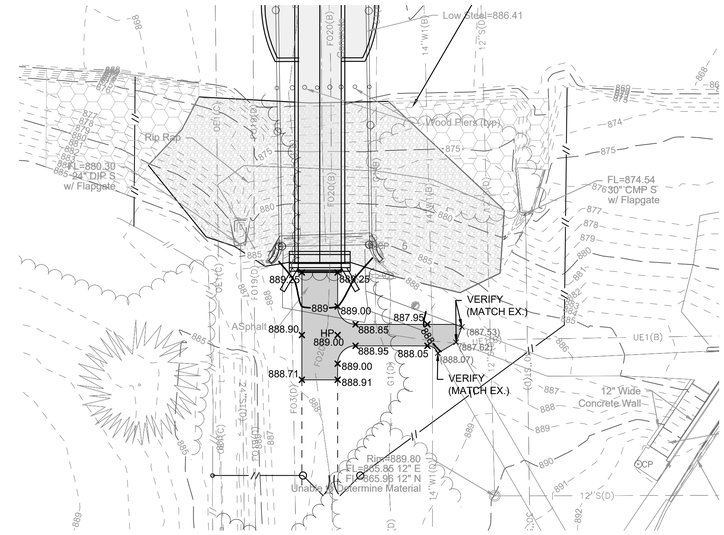
V:\Projects\2024\124.0187.01\CADD\SP06_1240187_GRAD.dwg SHANE T. TULLY, GRADING, POLLUTION PREVENTION, AND EROSION CONTROL PLAN, 2024/10/22, 4:59 PM, ARCH FULL BLEED D (36.00 X 24.00 INCHES)

WARNING! OVERHEAD ELECTRIC, UNDERGROUND GAS MAIN AND MULTIPLE FIBER OPTIC LINES EXIST WITHIN THIS PROJECT AREA. THESE UTILITIES ARE TO BE LOCATED AND PROTECTED AT ALL TIMES BY THE CONTRACTOR.

GRADING NOTES

1. CONTRACTOR TO STRIP AND STOCKPILE TOPSOIL ON ALL AREAS TO BE CUT OR FILLED. RESPREAD TO MINIMUM 6" DEPTH TO FINISH GRADES.
2. ANY EXCESS CUT TO BE SPREAD ON SITE AS DIRECTED BY ENGINEER DURING CONSTRUCTION. PLACE TOPSOIL OVER ALL AREAS DISTURBED.
3. ALL DRAINAGE SWALES AND SLOPES 5 TO 1 OR GREATER TO BE SEEDED USING COMMERCIALLY AVAILABLE EROSION CONTROL SEED. MIXTURE APPLIED AT RATE RECOMMENDED BY SUPPLIER.
4. EROSION CONTROL: SEED THE SITE AFTER ROUGH GRADING HAS BEEN COMPLETED. PLACE SILT FENCE AND MAINTAIN IN PROBLEM AREAS AFTER GROUND COVER HAS BEEN ESTABLISHED. COMPLY WITH EROSION CONTROL LAW.
5. PROVIDE BELOW GRADE INLET PROTECTION IN PAVED AREAS FOLLOWING PAVING OPERATIONS.





SOUTH BRIDGE SIDEWALK AREA
SCALE: 1"=20'

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = 20'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01

Sheet C401

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

GRADING PLAN - PLAZA AREA

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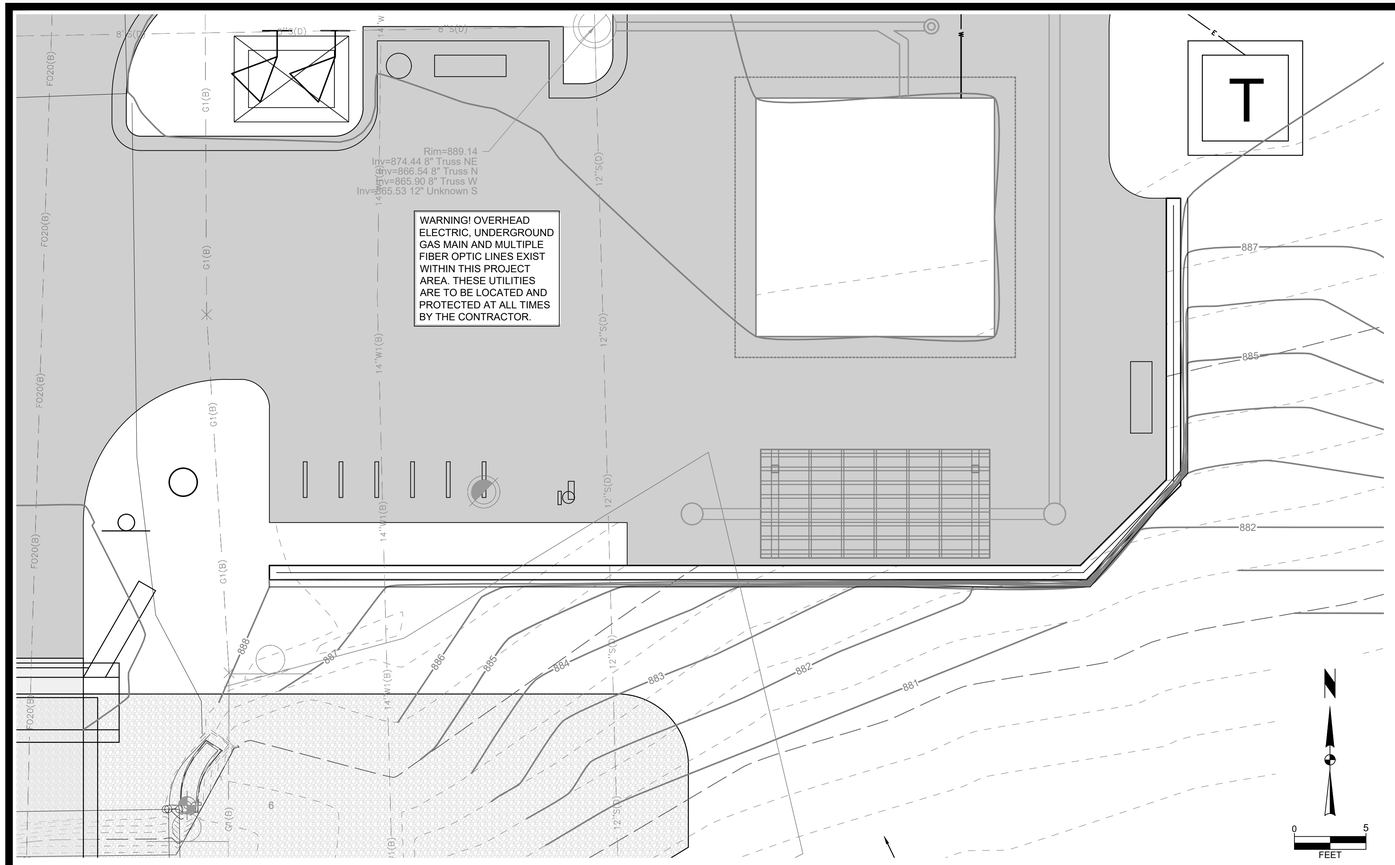
SNYDER & ASSOCIATES

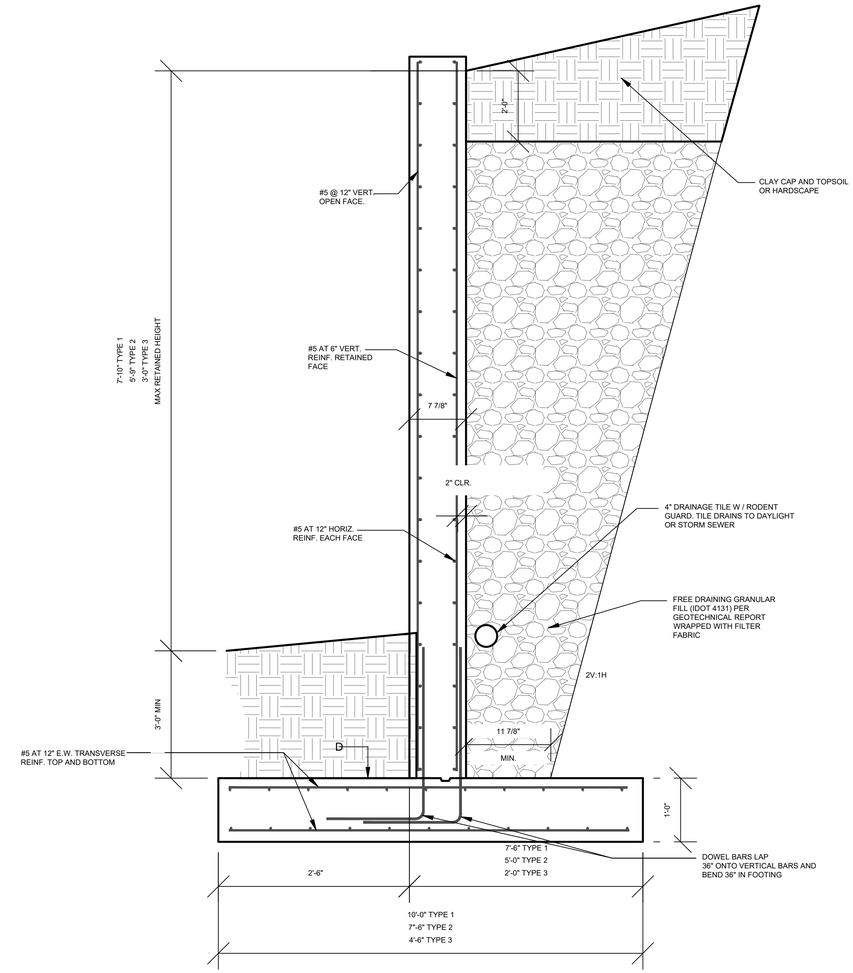
Project No: 124.0187.01

Sheet C401

V:\Projects\2024\124.0187.01\CADD\SPCS_124.0187_GRADING PLAN - PLAZA AREA_2024\1022_5:07 PM, ARCH FULL BLEED (36.00 X 24.00 INCHES)

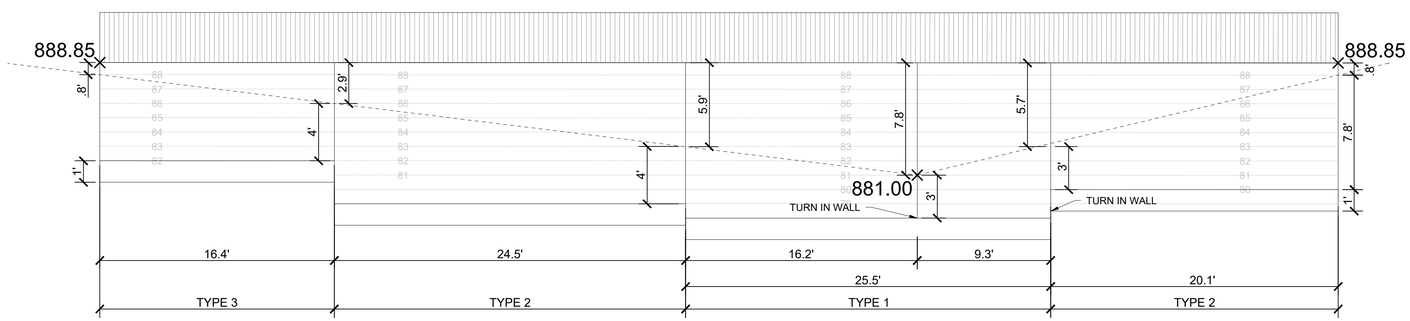


RETAINING WALL - PLAN VIEW



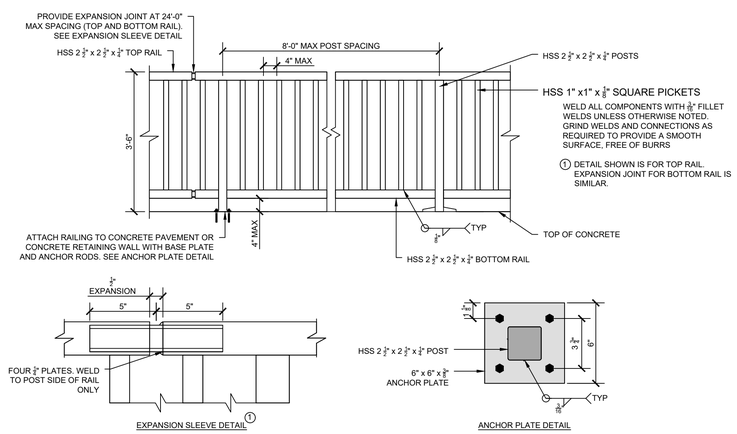
2 C402 RETAINING WALL

NO SCALE



1 C402 RETAINING WALL - ELEVATION

1" = 5'



3 C402 RAILING

NO SCALE

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = 5'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS

Project No: 124.0187.01

Sheet C402

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

RETAINING WALL

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet C402

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GENERAL

1. ALL ELEVATIONS REFERENCED TO LOCAL DATUM - SEE CIVIL

2. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION.

3. ALL OF THE WORK TO BE DONE UNDER THIS CONTRACT SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWINGS, THE GENERAL REQUIREMENTS OF DIVISION ONE, THE GENERAL CONDITIONS, THE SPECIFICATIONS, AND ANY ADDENDA THERETO.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ACQUAINT THEMSELVES AND ALL SUPERVISORY PERSONNEL WITH THE ABOVE-NAMED DRAWINGS AND DOCUMENTS.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING THE SITE OF THE PROPOSED WORK TO SATISFY THEMSELVES AS TO THE EXISTING CONDITIONS RELATIVE TO THE CONTRACT.

6. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL TEMPORARY SHORING/BRACING OF COLUMNS, BEAMS, JOISTS, ETC., AS REQUIRED BY ALL FEDERAL, STATE AND LOCAL AGENCIES HAVING JURISDICTION, UNTIL ALL PERMANENT FRAMING IS INSTALLED.

7. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. SHOULD ANY UTILITIES BE FOUND DIFFERENT THAN LOCATED, THEY SHALL BE PROTECTED IN PLACE AND THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.

8. ALL CONSTRUCTION SHALL CONFORM TO INTERNATIONAL BUILDING CODE 2021 UNLESS NOTED OTHERWISE.

DESIGN LOADS:

RETAINING WALL SURCHARGE LOAD: 200 PSF

CORRIDORS AND STAIRWAYS: 100 PSF

SNOW: Pg = 30 PSF

WIND: BASIC WIND SPEED (3-second gust) = 115 MPH
Iw = 1.00

CONCRETE MIX DESIGN

1. CONTRACTOR TO SUBMIT CONCRETE MIXTURE DESIGN AND PRODUCT DATA FOR EACH PRODUCT USED. THE CONCRETE MIX SHALL INCLUDE A MIXTURE IDENTIFICATION NUMBER AND A LIST OF ALL DESIGN VALUES AND PRODUCT QUANTITIES USED FOR THE MIXTURE.

2. PORTLAND CEMENT: ASTM C150/C150M, TYPE IL, GRAY

3. FLY ASH: ASTM C618, CLASS C OR F.

4. SLAG CEMENT: ASTM C989/C989M, GRADE 100 OR 120.

5. NORMAL-WEIGHT AGGREGATES: ASTM C33/C33M, COARSE AGGREGATE OR BETTER, GRADED. PROVIDE AGGREGATES FROM A SINGLE SOURCE.

6. ALKALI CONTENT IN CONCRETE: NOT MORE THAN 4 LB./CU. YD. FOR MODERATELY REACTIVE AGGREGATE OR 3 LB./CU. YD. FOR HIGHLY REACTIVE AGGREGATE, WHEN TESTED IN ACCORDANCE WITH ASTM C1293 AND CATEGORIZED IN ACCORDANCE WITH ASTM C1778, BASED ON ALKALI CONTENT BEING CALCULATED IN ACCORDANCE WITH ACI 301.

7. AIR-ENTRAINING ADMIXTURE: ASTM C260/C260M.

8. MAXIMUM COARSE-AGGREGATE SIZE: 1 INCH NOMINAL.

9. FINE AGGREGATE: FREE OF MATERIALS WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT.

10. CHEMICAL ADMIXTURES: CERTIFIED BY MANUFACTURER TO BE COMPATIBLE WITH OTHER ADMIXTURES THAT DO NOT CONTRIBUTE WATER-SOLUBLE CHLORIDE IONS EXCEEDING THOSE PERMITTED IN HARDENED CONCRETE. DO NOT USE CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE IN STEEL-REINFORCED CONCRETE.

11. MINIMUM COMPRESSIVE STRENGTH: 4000 PSI AT 28 DAYS.

12. MAXIMUM W/CM: 0.44.

13. SLUMP LIMIT: FOR WATER REDUCED MIXES, 8 INCHES PLUS OR MINUS 1 INCH FOR CONCRETE WITH VERIFIED SLUMP OF 2 TO 4 INCHES BEFORE ADDING HIGH-RANGE WATER-REDUCING ADMIXTURE OR PLASTICIZING ADMIXTURE.

14. AIR CONTENT: 6 PERCENT, PLUS OR MINUS 1.5 PERCENT AT POINT OF DELIVERY FOR CONCRETE CONTAINING 1-INCH NOMINAL MAXIMUM AGGREGATE SIZE.

15. LIMIT WATER-SOLUBLE, CHLORIDE-ION CONTENT IN HARDENED CONCRETE TO 0.30 PERCENT BY WEIGHT OF CEMENT.

16. BONDING AGENT IS TO BE SIKA ARMATEC 110 EPOCEM BONDING AGENT OR APPROVED EQUAL.

FOUNDATION NOTES

1. ALL PIERS AND COLUMNS ARE CENTERED ON PADS U.N.O. WALLS CENTERED ON FOOTINGS U.N.O.

2. ALL FOOTINGS SHALL REST ON UNDISTURBED SOIL OR CONTROLLED COMPACTED FILL. IF UNUSUAL OR QUESTIONABLE CONDITIONS ARE ENCOUNTERED, DO NOT PROCEED UNTIL THE ENGINEER HAS BEEN NOTIFIED.

3. PROVIDE KEYWAY AT TOP OF ALL FOOTINGS, END OF WALL POURS, SLAB POURS AND END OF FOOTING POURS.

4. PROVIDE DOWELS FROM FOOTINGS TO WALLS. USE SAME NUMBER AND SPACING AS VERTICAL WALL BARS, U.N.O.

5. PROVIDE BENT BARS 2'-0" X 2'-0" AT ALL CORNERS AND INTERSECTIONS IN WALLS AND FOOTINGS. USE SAME NUMBER AND SPACING AS HORIZONTAL BARS.

6. BACKFILL EACH SIDE OF WALL SIMULTANEOUSLY.

7. FORM TOPS OF ALL FOOTINGS, PADS AND GRADE BEAMS TO ENSURE CORRECT LINE AND GRADE.

8. BOTTOM OF EXTERIOR FOOTINGS AND WALLS TO BE AT LEAST 4'-0" BELOW FINAL GROUND LINE.

9. FOUNDATION CONSTRUCTION SHALL CONFORM TO ALLENDER BUTZKE ENGINEERS PROJECT NO. PN 241280.

10. THE OWNER SHALL HIRE A SOIL TESTING LABORATORY TO VERIFY SOIL BEARING CAPACITY OF EACH FOOTING PRIOR TO PLACING CONCRETE.

11. SHOULD THE SOILS BECOME DISTURBED OR SATURATED PRIOR TO CONCRETE PLACEMENT; AFFECTED SOIL SHALL BE REMOVED AND REPLACED WITH CONTROLLED COMPACTED ENGINEERED FILL.

12. IF UNSUITABLE SUPPORT MATERIALS ARE ENCOUNTERED, SOIL SHALL BE EXCAVATED UNTIL SUITABLE SOIL IS ENCOUNTERED. BACKFILL SHALL BE WITH CONTROLLED COMPACTED ENGINEERED FILL ACCORDING TO GEOTECHNICAL ENGINEER.

13. ASSUMED NET ALLOWABLE FOUNDATION BEARING PRESSURE ON UNDISTURBED SOIL = 1500 PSF.

CONCRETE

1. CONCRETE TO BE IN ACCORDANCE WITH "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 301 CURRENT EDITION)".

2. REINFORCING STEEL TO BE BENT AND PLACED IN ACCORDANCE WITH "MANUAL OF STD. PRACTICE FOR DETAILING CONCRETE STRUCTURES (ACI 315 CURRENT EDITION)".

3. ALL CONCRETE SHALL BE 4000 PSI AT 28 DAYS.

4. CONCRETE EXPOSED TO FREEZE/THAW CONDITIONS SHALL BE AIR ENTRAINED.

5. COARSE AGGREGATE FOR FOOTINGS AND UNEXPOSED WALLS MAY BE GRAVEL.

6. COARSE AGGREGATE FOR SLABS AND EXPOSED WALLS TO BE CRUSHED LIMESTONE.

7. MAXIMUM AGGREGATE SIZE TO BE 1" - U.N.O.

8. ALL AGGREGATE IN ACCORDANCE WITH ASTM C33. LIMIT SHALE, CHERT, COAL AND IRON OXIDE.

9. 4000 PSI CONCRETE TO HAVE A MIN. 6 SACKS CEMENT/MAX. 5 GAL. OF WATER/SACK.

10. WATER REDUCER REQUIRED FOR ALL BEAMS, WALLS AND SLABS.

11. CONCRETE WATER-CEMENT RATIO INDICATED FOR DESIGN MIXES TO HAVE CEMENT CONTENT ADJUSTED TO PROVIDE A WORKABLE MIX.

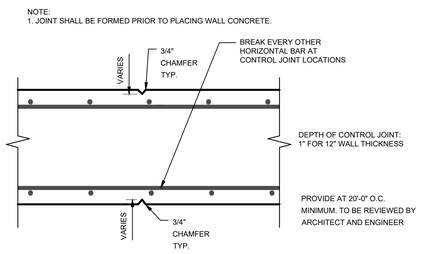
12. USE OF CALCIUM CHLORIDES PROHIBITED.

13. ALL REINFORCING STEEL TO BE ASTM A615 - GRADE 60.

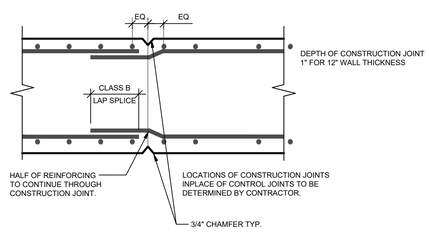
14. CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR TO BE:
    - 3" CAST AGAINST EARTH.
    - 2" TYPICAL

15. ALL REINFORCING STEEL SHALL BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

16. MAXIMUM SPACING OF BAR SUPPORTS TO BE 3'-0" O.C. EACH WAY.



1 C403 TYP. WALL CONTROL JOINT DETAIL
NO SCALE



2 C403 TYP. WALL CONSTRUCTION JOINT DETAILS
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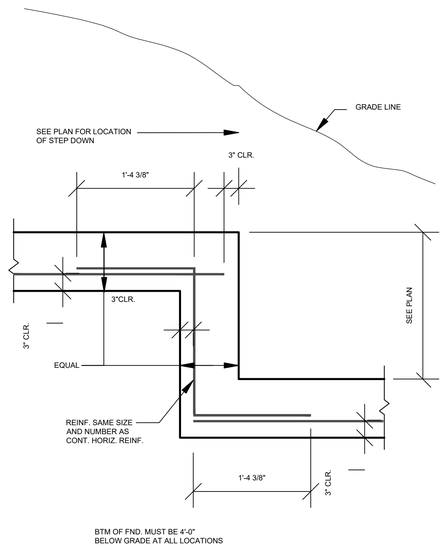
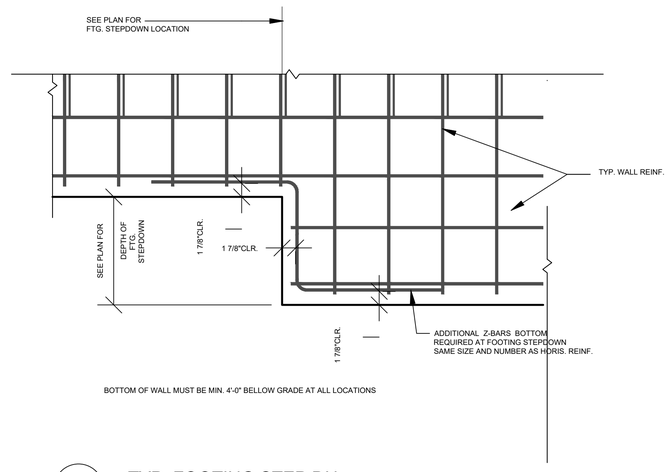


3 C403 TYPICAL WALL STEP DN. DETAIL
NO SCALE



4 C403 TYP. FOOTING STEP DN.
NO SCALE

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01

Sheet C403

MARSHALLTOWN, IOWA

2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

LINN CREEK TRAILHEAD

RETAINING WALL NOTES AND DETAILS

SNYDER & ASSOCIATES, INC.

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C403

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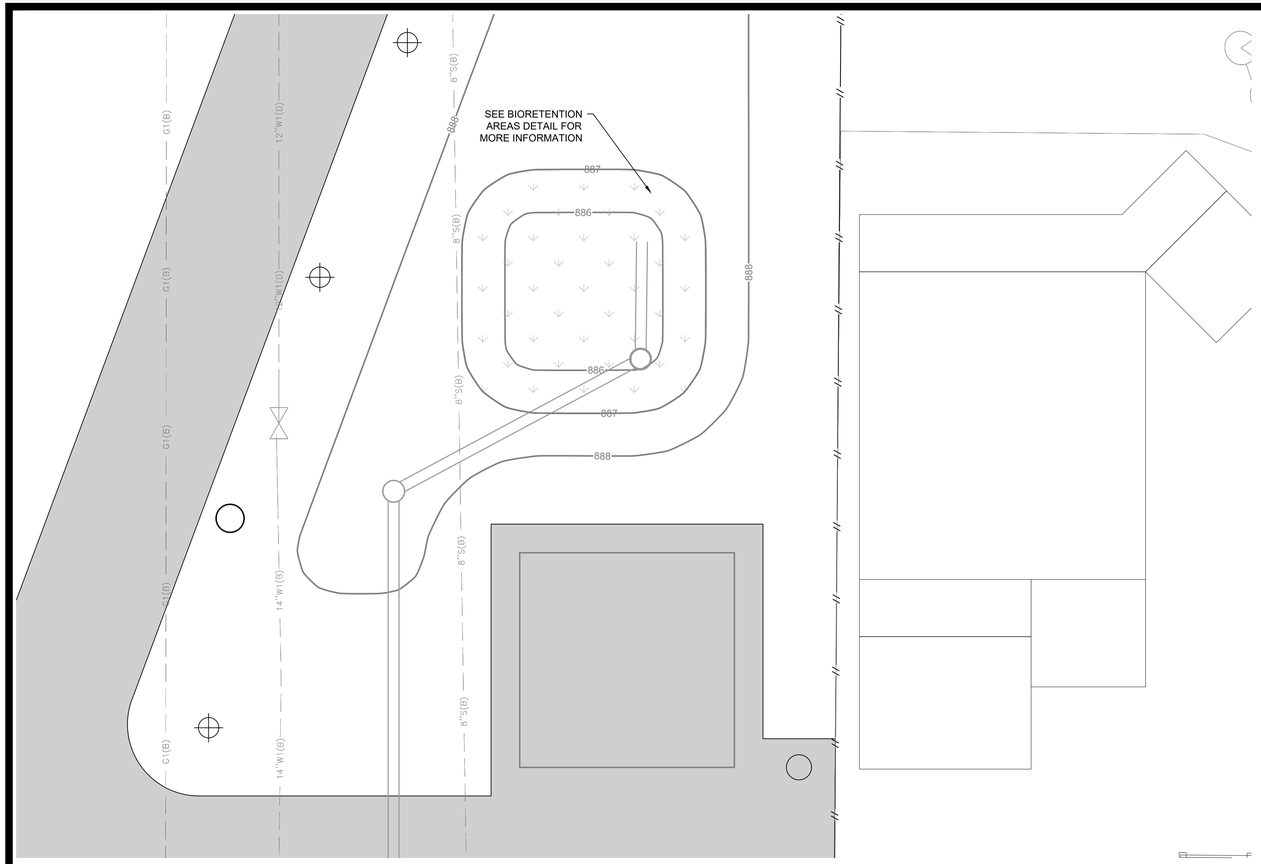
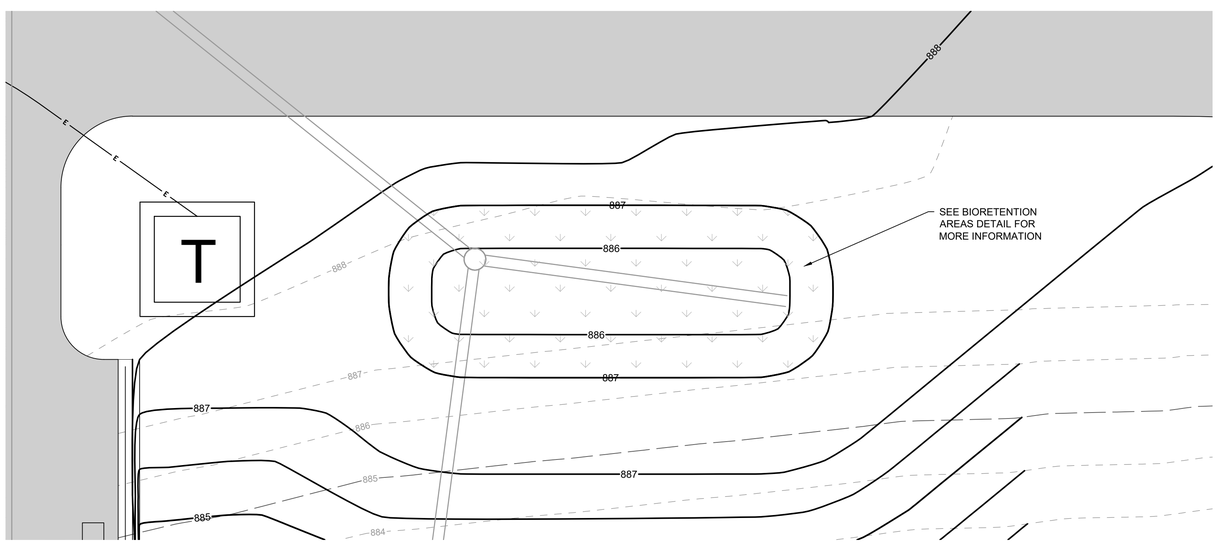


1 C404 BIORETENTION - AREA A

1" = 5'



2 C404 BIORETENTION - AREA B

1" = 5'

LEGEND

BIO RETENTION SEEDING / PLUG LIMITS

NOTES:

1. SCARIFY TRENCH BOTTOM TO A DEPTH OF 12" PRIOR TO POROUS BACKFILL PLACEMENT.
2. POROUS BACKFILL: 1 TO 1-1/2" CLEAN LIMESTONE.
3. BIO-CELL SOIL MIX (AMENDED SOILS): 50% CONCRETE SAND, 25% LOAM TOPSOIL, 25% CLASS 1 LEAF TYPE COMPOST. MIX BIO-RETENTION SOIL AT AN OFF-SITE LOCATION.
4. PLACE BIO-CELL SOIL MIX IN 12" LIFTS AND COMPACT MODERATELY.
5. PLANT SCHEDULE:

A. GRAND MEADOW MIX SEEDING INCLUDES TILLING, SPREADING, FERTILIZING, WATERING, AND OTHER ACTIVITIES AS REQUIRED TO ESTABLISH FINAL VEGETATION. SEED MIX SHALL CONSIST OF THE FOLLOWING:

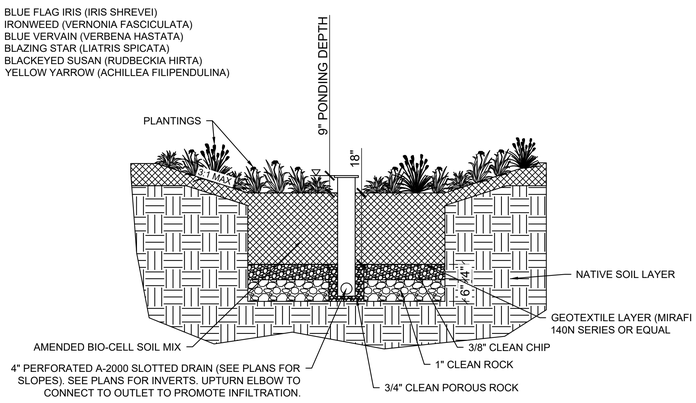
GRASSES AND FORBES:
ANISE HYSSOP, CANADA ANEMONE, BUTTERFLY MILKWEED, SMOOTH BLUE ASTER, NEW ENGLAND ASTER, UPLAND WHITE ASTER, CANADA MILKWEED, FALSE ASTER, PARTRIDGE PEA, WILD SIENNA, TALL COREOPSIS, SHOWY TICK TREFOIL, PALE PURPLE CONEFLOWER, RATTLESNAKE MASTER, CREAM GENTIAN, OX-EYE SUNFLOWER, PRAIRIE ALUMROOT, GREAT ST JOHN'S WORT, ROUNDHEAD BUSHCLOVER, ROUGH BLAZINGSTAR PRAIRIE BLAZINGSTAR, WILD LUPINE, WILD BERGAMOT, DOTTED MINT, WILD QUININE, FOXGLOVE BEARDTONGUE, WHITE PRAIRIE CLOVER, PURPLE PRAIRIE CLOVER, PRAIRIE CINQUEFOIL, MOUNTAIN MINT, YELLOW CONEFLOWER, BLACKEYED SUSAN, SWEET BLACKEYED SUSAN, BROWNEYED SUSAN, ROSINWEED, COMPASS PLANT, CUP PLANT, RIDDELL'S GOLDENROD, HOARY VERVAIN, IRONWEED, GOLDEN ALEXANDER, BIG BLUESTEM, LITTLE BLUESTEM, ROUGH DROPSEED, VIRGINIA WILD RYE, INDIANGRASS

SEEDING RATE: 15 LBS. PER 1 ACRE. SEED MIX MAY BE OBTAINED FROM ION EXCHANGE WWW.IONXCHANGE.COM (1878 OLD MISSION DRIVE, HARPERS FERRY, IOWA, 52146-7533, 800-291-2143) OR APPROVED EQUAL. ALLOWABLE SEEDING DATES SHALL BE DETERMINED BY MANUFACTURER'S RECOMMENDATION.

B. CONTAINER PLUG PLANTINGS SHALL BE PLANTED WITHIN THE BIO-RETENTION AREA. CONTAINER PLUG PLANTS SHALL BE PLACED RANDOMLY AT A RATE OF ONE PLANT PER S.F.

CONTAINER PLUG PLANTS:

BLUE FLAG IRIS (IRIS SHREVEI)
IRONWEED (VERNONIA FASCICULATA)
BLUE VERVAIN (VERBENA HASTATA)
BLAZING STAR (LIATRIS SPICATA)
BLACKEYED SUSAN (RUDBECKIA HIRTA)
YELLOW YARROW (ACHILLEA FILIPENDULINA)



3 C404 BIORETENTION AREAS - DETAIL

NO SCALE

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = 5'
Technician: TKV | Date: 10/22/2024 | 1"-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C404

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

GRADING PLAN - BIORETENTION AREAS

SNYDER & ASSOCIATES, INC.
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515-964-2020 | www.snyder-associates.com

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Project No: 124.0187.01
Sheet C404

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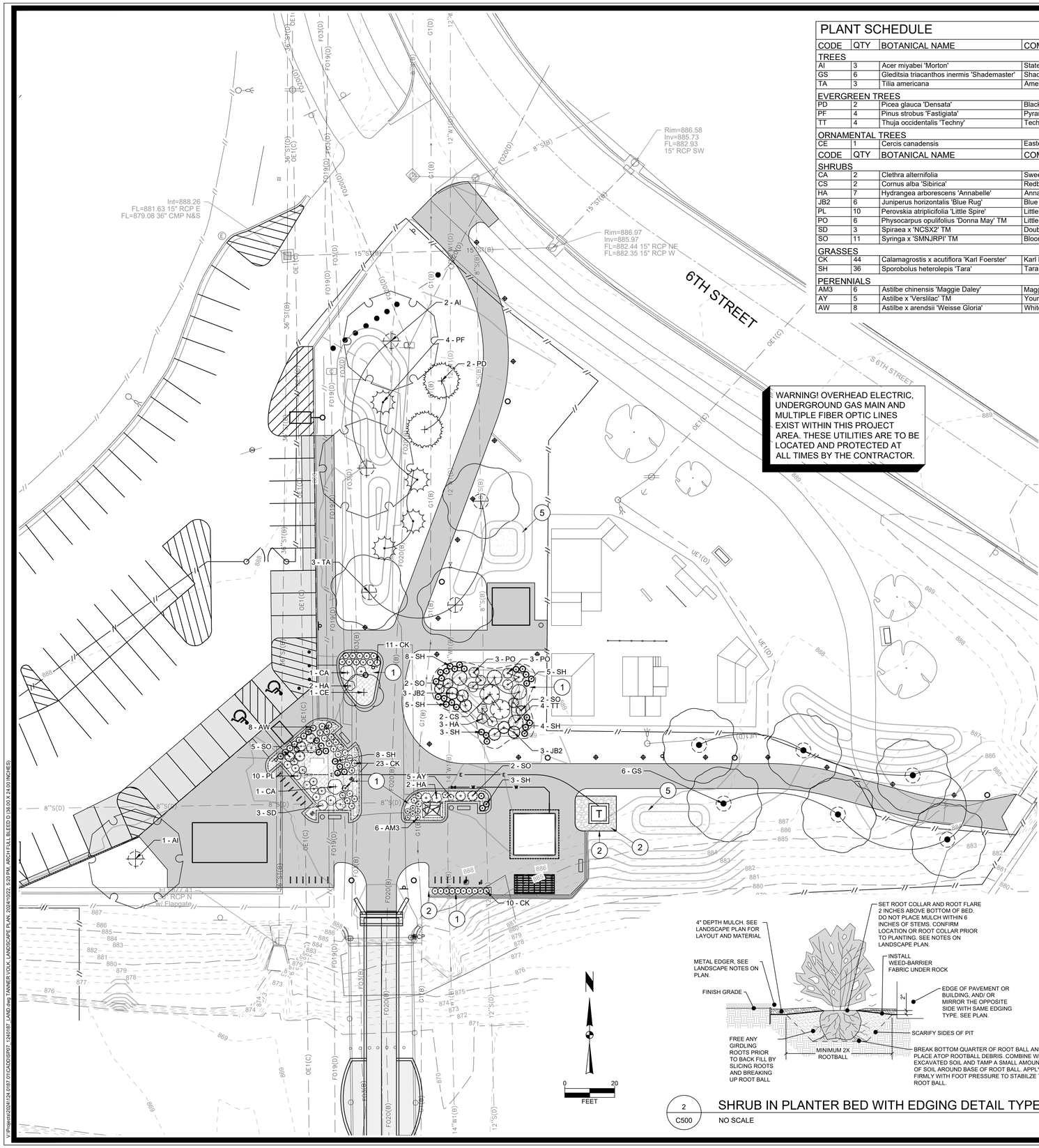


WARNING! OVERHEAD ELECTRIC, UNDERGROUND GAS MAIN AND MULTIPLE FIBER OPTIC LINES EXIST WITHIN THIS PROJECT AREA. THESE UTILITIES ARE TO BE LOCATED AND PROTECTED AT ALL TIMES BY THE CONTRACTOR.

PLANT SCHEDULE

CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	TYPE
TREES					
AI	3	Acer miyabei 'Morton'	State Street™ Miyabe Maple	2" Cal.	B&B
GS	6	Gleditsia triacanthos inermis 'Shademaster'	Shademaster Honey Locust	1.5" Cal.	B&B
TA	3	Tilia americana	American Linden	1.5" Cal.	B&B
EVERGREEN TREES					
PD	2	Picea glauca 'Densata'	Black Hills White Spruce	6` Ht.	B&B
PF	4	Pinus strobus 'Fastigiata'	Pyramidal White Pine	6` Ht.	B&B
TT	4	Thuja occidentalis 'Techny'	Techny Arborvitae	5` Ht.	B&B
ORNAMENTAL TREES					
CE	1	Cercis canadensis	Eastern Redbud Multi-trunk	6` Ht.	CONTAINER
CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
SHRUBS					
CA	2	Clethra alternifolia	Sweet Pepperbush	3 gal.	Pot
CS	2	Cornus alba 'Sibirica'	Redbark Dogwood	3 gal.	Pot
HA	7	Hydrangea arborescens 'Annabelle'	Annabelle Hydrangea	3 gal.	Pot
JB2	6	Juniperus horizontalis 'Blue Rug'	Blue Rug Juniper	3 gal.	Pot
PL	10	Perovskia atriplicifolia 'Little Spire'	Little Spire Russian Sage	3 gal.	Pot
PO	6	Physocarpus opulifolius 'Donna May' TM	Little Devil Dwarf Ninebark	3 gal.	Pot
SD	3	Spiraea x 'NCSX2' TM	Double Play Doozie Spirea	3 gal.	Pot
SO	11	Syringa x 'SMNJRPI' TM	Bloomerang Dwarf Pink Lilac	3 gal.	Pot
GRASSES					
CK	44	Calamagrostis x acutiflora 'Karl Foerster'	Karl Foerster Feather Reed Grass	3 gal.	Pot
SH	36	Sporobolus heterolepis 'Tara'	Tara Prairie Dropseed	1 gal.	Pot
PERENNIALS					
AM3	6	Astilbe chinensis 'Maggie Daley'	Maggie Daley Chinese Astilbe	1 gal.	Pot
AY	5	Astilbe x 'Versilac' TM	Younique Lilac Astilbe	1 gal.	Pot
AW	8	Astilbe x arendsii 'Weisse Gloria'	White Gloria Astilbe	1 gal.	Pot

PLANTING PLAN GENERAL NOTES

A. ALL PLANT MATERIAL SHALL AT LEAST MEET MINIMUM REQUIREMENTS SHOWN IN THE "AMERICAN STANDARDS FOR NURSERY STOCK" (ANSI Z60.1-LATEST EDITION).

B. CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR FROM DATE OF INSTALLATION.

PLANTING PLAN CONSTRUCTION NOTES

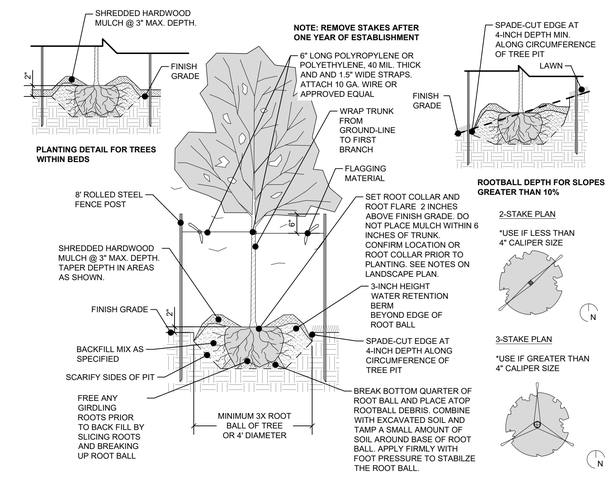
1. PROVIDE 3-INCH DEPTH SHREDDED HARDWOOD MULCH IN PLANT BED AREAS AS INDICATED ON PLAN AND PROVIDE A MIN 3-FOOT PERIMETER RING AROUND ALL TREES. PROVIDE VERTICAL CUT NATURAL EDGE TO A DEPTH OF 4-INCHES FOR TREE RINGS.
2. PROVIDE 2-3 INCH WASHED RIVER ROCK MULCH IN AREAS AS INDICATED ON PLAN AND PROVIDE MIN 3 oz FILTER FABRIC UNDERLAY. PROVIDE 6" DEPTH $\frac{3}{16}$" BLACK METAL EDGER WITH STAKES.
3. SEED ALL AREAS DISTURBED BY CONSTRUCTION WITH 90-10 TURF GRASS BLEND LAWN SEED MIX AND COVER WITH HYDRO MULCH.
4. CONTRACTOR SHALL PROVIDE AMENDED SOILS CONSISTING OF 50% COMPOST AND 50% TOP SOIL AT 6 INCH DEPTH WITHIN PLANT BED AREAS.
5. PROVIDE WETLAND SEED MIX IN BIO RETENTION AREAS SHOWN.
   PRAIRIE MOON NURSERY
   DETENTION SEED MIX
   WINONA, MN
   T: 507-458-1362
   WWW.PRAIRIEMOON.COM

PLANTING PLAN REQUIREMENTS

LANDSCAPE REQUIREMENTS AND CALCULATIONS:
(AS PER CITY OF MARSHALLTOWN SITE PLAN OPEN SPACE AND LANDSCAPING REQUIREMENTS)

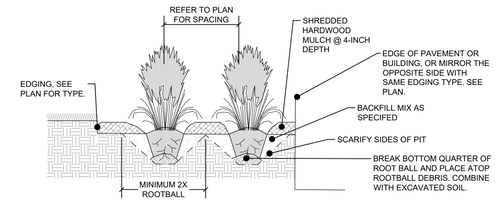
PLANTING LEGEND

- 90/30 LAWN SEED WITH HYDRO MULCH
- 2"-3" ROCK MULCH, 3" DEPTH UNDERLAID WITH MIN. 3 oz. WEED BARRIER.
- WOOD MULCH, 3" DEPTH
- DETENTION SEED MIX



1 C500 DECIDUOUS TREE SINGLE-TRUNK DETAIL
NO SCALE

2 C500 SHRUB IN PLANTER BED WITH EDGING DETAIL TYPE A
NO SCALE



3 C500 PERENNIAL PLANTING BED DETAIL TYPE A
NO SCALE

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C500

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

LANDSCAPE PLAN

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

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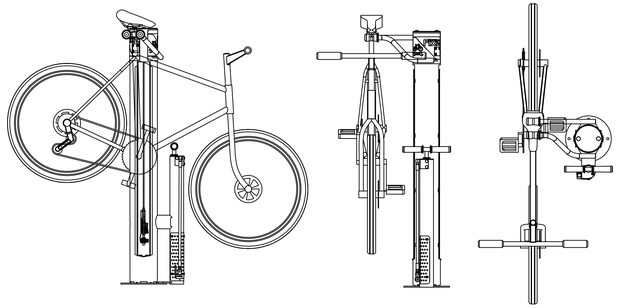
Project No: 124.0187.01
Sheet C500

V:\Projects\2024\124.0187.01\CADD\SPO\ 124.0187 - LAND.dwg, FANNER VOLK, LANDSCAPE PLAN, 2024/10/22, 5:20 PM, ARCH FULL BLEED D (36.00 X 24.00 INCHES)



FIXIT PLUS, AS PROVIDED BY DERO, A PLAYCORE COMPANY, OR EQUAL.
5522 LAKELAND AVE. N. MINNEAPOLIS, MN 55429
P. 888-337-6729
WWW.DERO.COM

FINISH: POWDER COATED BLACK
ACCESS: SINGLE SIDED
PUMP: AIR KIT PRIME
INSTALL: SURFACE MOUNT

INSTALL IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS, SPECIFICATIONS AND REQUIREMENTS:

LOCAL CONTACT FOR PLAYGROUND EQUIPMENT:
DERO A PLAYCORE COMPANY,
JASON JENKINS
P: 681-4720
JASON@DERO.COM

1 / C600 **BIKE FIX-IT STATION**

NO SCALE

LANDSCAPE FORMS LOOP BIKE RACK

COLOR: MATTE BLACK
FINISH: POWDER COATED
INSTALL: SURFACE MOUNT

LANDSCAPE FORMS, INC.
CONTACT: CONNOR LOCKWOOD
O: 269-276-4590
E: CONNORL@LANDSCAPEFORMS.COM

2 / C600 **BIKE RACKS**

NO SCALE

LANDSCAPE FORMS LAKESIDE BENCH

COLOR: MATTE BLACK
FINISH: POWDER COATED
INSTALL: SURFACE MOUNT
PATTERN: CUSTOM PATTERN TO BE APPLIED TO MATCH WATER PLAZA PATTERN

LANDSCAPE FORMS, INC.
CONTACT: CONNOR LOCKWOOD
O: 269-276-4590
E: CONNORL@LANDSCAPEFORMS.COM

3 / C600 **BENCH**

NO SCALE

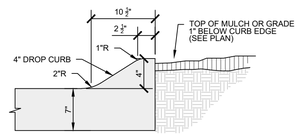
LANDSCAPE FORMS LAKESIDE LITTER RECEPTACLE

COLOR: MATTE BLACK
FINISH: POWDER COATED
INSTALL: SURFACE MOUNT
PATTERN: CUSTOM PATTERN TO BE APPLIED TO MATCH WATER PLAZA PATTERN

LANDSCAPE FORMS, INC.
CONTACT: CONNOR LOCKWOOD
O: 269-276-4590
E: CONNORL@LANDSCAPEFORMS.COM

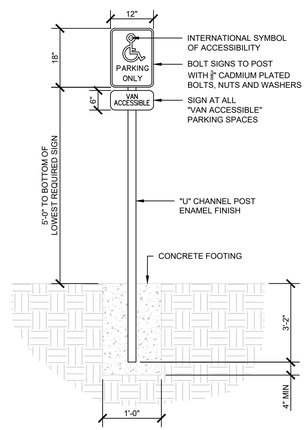
4 / C600 **TRASH RECEPTACLE**

NO SCALE



5 / C600 **4-INCH ROLLED CURB**

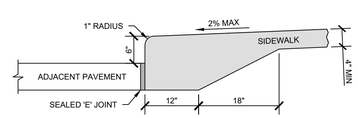
NO SCALE



NOTE: SIGNS AS PER ADAAG STANDARDS

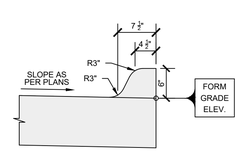
6 / C600 **ACCESSIBLE PARKING SIGN**

NO SCALE



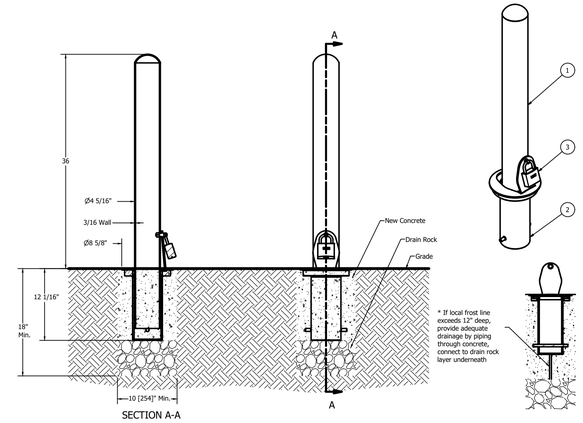
7 / C600 **INTEGRAL SIDEWALK AND CURB DETAIL**

NO SCALE



8 / C600 **6-INCH STANDARD CURB**

NO SCALE



Removable Receiver with Lid

NOTE: PROVIDE/INSTALL 4 REMOVABLE/LOCK BOLLARDS. INSTALL AS PER MANUFACTURER'S RECOMMENDATIONS, REQUIREMENTS, AND SPECIFICATIONS.

RELIANCE FOUNDRY
UNIT 207, 6450 - 149TH STREET
SURREY, BRITISH COLUMBIA, CANADA
V3S 7G7
1-877-789-3245
INFO@RELIANCE-FOUNDRY.COM
COLOR: SEMI GLOSS BLACK

9 / C600 **BOLLARD FOOTING DETAIL - MODEL R-7902**

NO SCALE

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C600

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

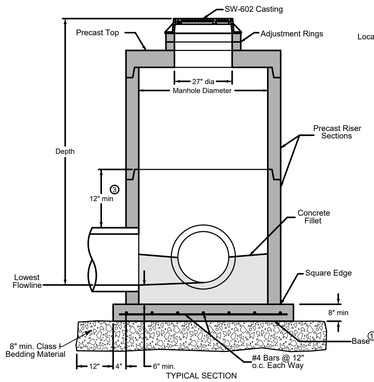
SITE DETAILS

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C600

V:\Projects\2024\124.0187.01\CAD\SHEETS\124.0187.01 SITE DETAILS 2024\10\22 8:00 PM SHANE.T.TULLY, SITE DETAILS, ARCH FULL BLEED D (36.00 X 24.00 INCHES)



TYPICAL SECTION

PLAN

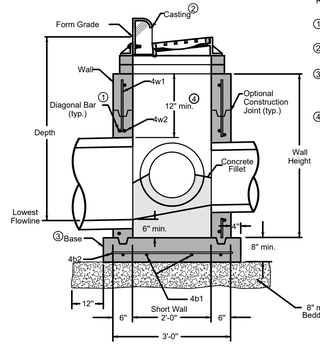
If manhole depth exceeds 20 feet, install steps.

1. Cast-in-place base shown. If base is precast integral with bottom riser, the footprint of the base is not required to extend beyond the outer edge of the riser.
2. For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
3. 12 inch minimum riser height above all pipe openings.

Manhole Diameter (inches)	Maximum Pipe Diameter (inches) for 2 Pipes (2)	
	At 180° Separation	At 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42

1 / C601 SW-401 CIRCULAR STORM SEWER MANHOLE

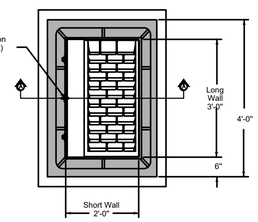
NO SCALE



SECTION A-A

Refer to SW-514 for boxout details.

1. Install four #4 diagonal bars at all pipe openings.
2. SW-603 Type R unless Type Q is specified in the contract documents.
3. 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.
4. 12 inch minimum wall height above all pipes.



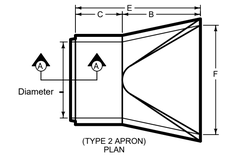
PLAN

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"

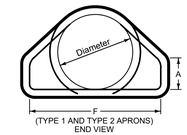
MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	15"	18"
Long Wall	24"	30"

2 / C601 SW-501 SINGLE GRATE INTAKE

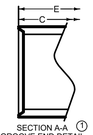
NO SCALE



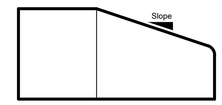
(TYPE 2 APRON) PLAN



(TYPE 1 AND TYPE 2 APRONS) END VIEW



SECTION A-A (1) GROOVE END DETAIL



SIDE VIEW

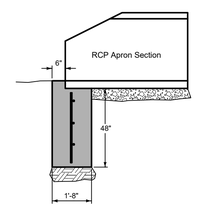
TYPE 2 APRONS						
DIAM.	SLOPE	A	B	MINIMUM C	MINIMUM E	F
12"	2.4:1	4"	2'-0"	4'-8 1/8"	6'-8 1/8"	2'-0"
15"	2.4:1	6"	2'-3"	5'-10"	6'-11"	2'-6"
18"	2.3:1	9"	2'-3"	5'-10"	6'-11"	3'-0"
21"	2.4:1	9"	3'-0"	5'-11"	6'-11"	3'-5"
24"	2.5:1	9 1/2"	3'-7 1/2"	2'-6"	6'-12"	4'-0"
27"	2.5:1	10 1/2"	4'-1"	2'-0"	6'-12"	4'-4"
30"	2.5:1	12"	4'-6"	1'-7"	6'-12"	5'-0"
36"	2.5:1	15"	5'-3"	2'-9"	8'-0"	6'-0"
42"	2.5:1	21"	5'-3"	2'-9"	8'-0"	6'-6"
48"	2.5:1	24"	6'-0"	2'-0"	8'-0"	7'-0"
54"	1.9:1	24"	5'-3"	2'-7"	8'-0"	7'-6"
60"	1.4:1	24"	5'-0"	3'-0"	8'-0"	8'-0"
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"
72"	1.4:1	24"	6'-6"	1'-9"	8'-3"	9'-0"
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"
84"	1.5:1	23 1/2"	7'-6 1/2"	1'-9"	9'-3 1/2"	10'-0"

Dimension 'E' shown is the minimum and is considered the design length. Adjust for any difference between the actual length of concrete apron installed and the length indicated below for the length of concrete culvert pipe furnished.

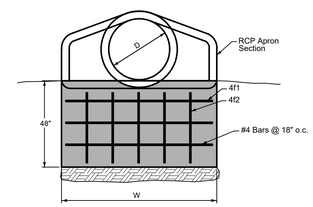
(1) Tongue end used on inlet end section. Groove end used on outlet end section.

4 / C601 CONCRETE PIPE APRON

NO SCALE



TYPICAL SECTION



ELEVATION

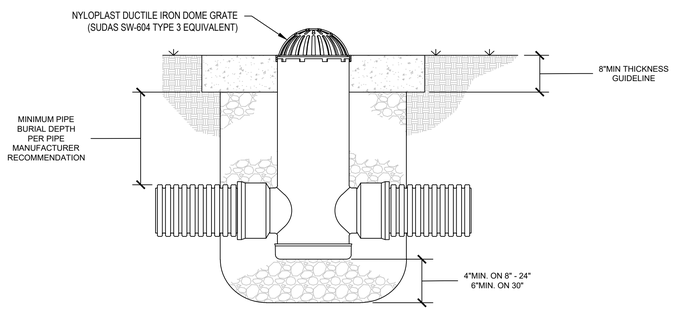
REINFORCING BAR LIST

D	W	Mark	Size	Length	Count
12"	2'-4"	4f1	4	2'-0"	3
		4f2	4	3'-8"	2
15"	2'-10 1/2"	4f1	4	2'-6 3/4"	3
		4f2	4	3'-8"	2
18"	3'-5"	4f1	4	3'-1"	3
		4f2	4	3'-8"	3
24"	4'-6"	4f1	4	4'-2"	3
		4f2	4	3'-8"	3
30"	5'-7"	4f1	4	5'-3"	3
		4f2	4	3'-8"	4
36"	6'-8"	4f1	4	6'-4"	3
		4f2	4	3'-8"	5
42"	7'-3"	4f1	4	6'-11"	3
		4f2	4	3'-8"	5

D	W	Mark	Size	Length	Count
48"	7'-10"	4f1	4	7'-6"	3
		4f2	4	3'-8"	6
54"	8'-5"	4f1	4	8'-1"	3
		4f2	4	3'-8"	6
60"	8'-11"	4f1	4	8'-7"	3
		4f2	4	3'-8"	6
66"	8'-11"	4f1	4	8'-7"	3
		4f2	4	3'-8"	6
72"	10'-0"	4f1	4	9'-8"	3
		4f2	4	3'-8"	7
78"	10'-7"	4f1	4	10'-3"	3
		4f2	4	3'-8"	7
84"	11'-1"	4f1	4	10'-9"	3
		4f2	4	3'-8"	8

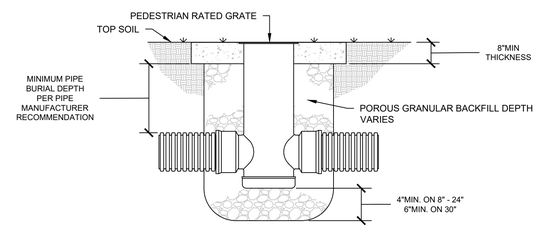
5 / C601 RCP FOOTING SECTION

NO SCALE



3 / C601 NYLOPLAST DRAIN BASIN DETAIL

NO SCALE



6 / C601 8" NYLOPLAST DRAIN WITH PEDESTRIAN RATED GRATE DETAIL

NO SCALE

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C601

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

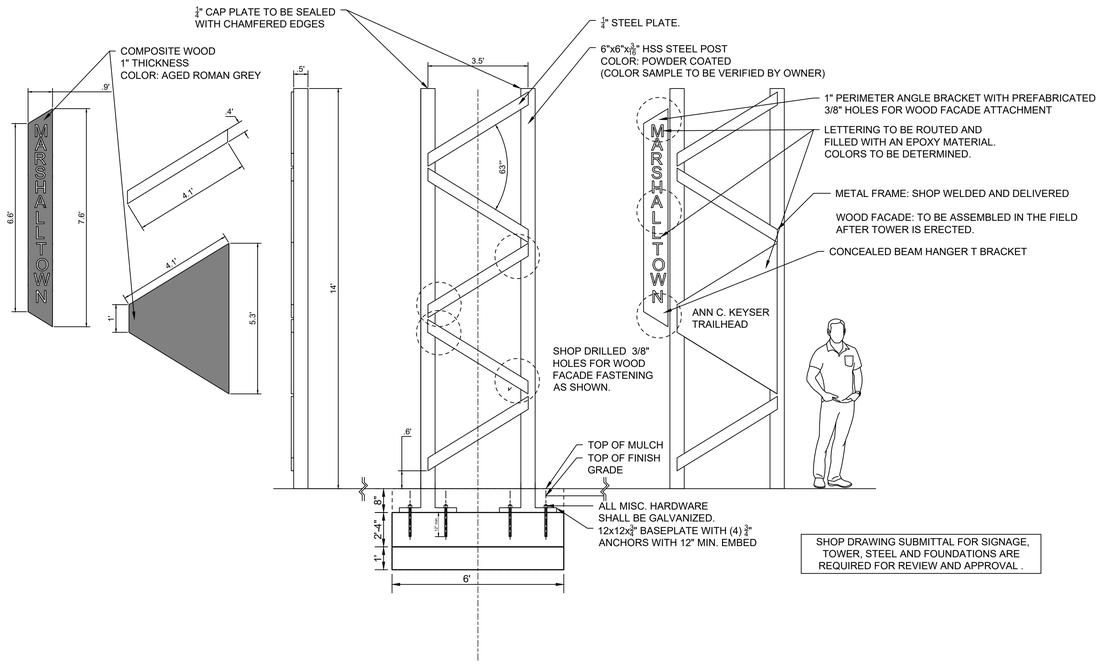
SITE DETAILS - STORM SEWER

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C601

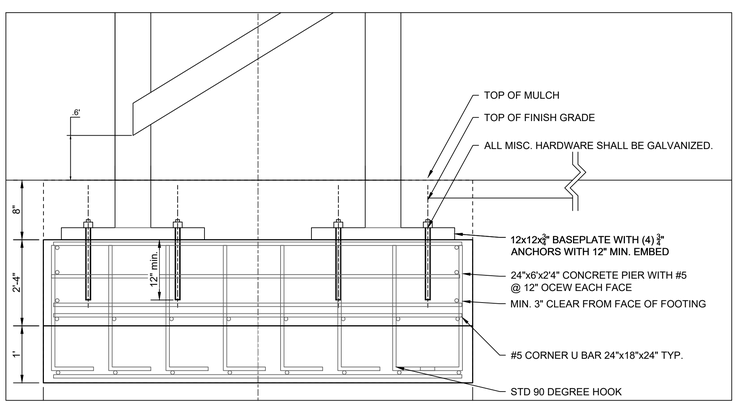
V:\Projects\2024\T24.0187.01\CADD\SPRS_124018F_DTLS.dwg SHANE_T TULLY, SITE DETAILS - STORM SEWER, 2024/10/22, 3:00 PM, ARCH FULL BLEED D (36.00 X 24.00 INCHES)

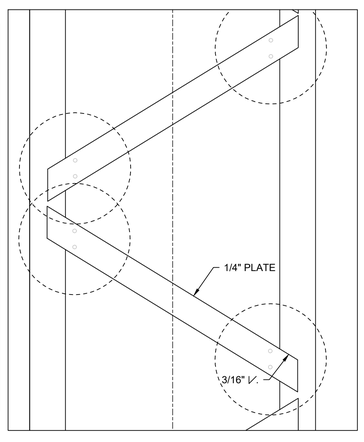


SHOP DRAWING SUBMITTAL FOR SIGNAGE, TOWER, STEEL AND FOUNDATIONS ARE REQUIRED FOR REVIEW AND APPROVAL .

1 C602 TOWER SIGNAGE

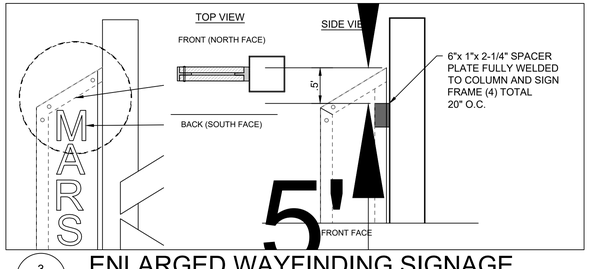
1'=2.5'





2 C602 ENLARGED WAYFINDING SIGNAGE

1'=2.5'

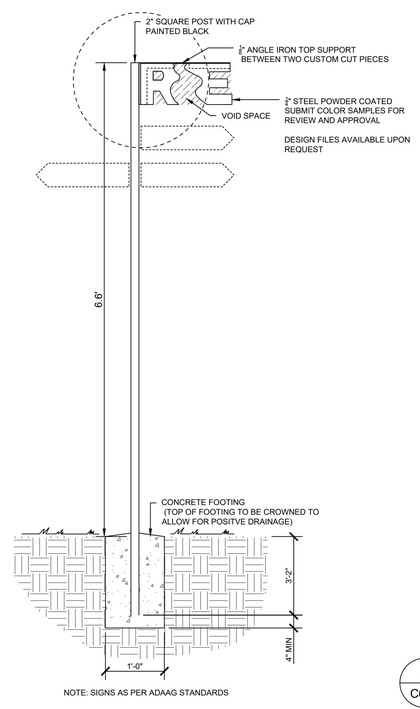


3 C602 ENLARGED WAYFINDING SIGNAGE

1'=1'

GENERAL STEEL NOTES

1. STRUCTURAL STEEL TO BE FABRICATED AND ERECTED IN ACCORDANCE WITH "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (AISC 360, CURRENT EDITION) AND "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (AISC 303, CURRENT EDITION).
2. STRUCTURAL STEEL WIDE FLANGE AND WT SECTIONS IN ACCORDANCE WITH ASTM A992.
3. STEEL CHANNELS, PLATES AND ANGLES IN ACCORDANCE WITH ASTM A36.
4. STEEL TUBES IN ACCORDANCE WITH ASTM A500 GRADE C (FY = 50 KSI).
5. STEEL PIPE IN ACCORDANCE WITH ASTM A53 GRADE B (FY = 35 KSI).
6. ALL ELECTRODES E70 SERIES.
7. ANCHOR BOLTS / RODS - ASTM F 1554 (GRADE 36), U.N.O.
8. EXPANSION ANCHORS SHALL BE HILTI KWIK BOLT TZ OR APPROVED EQUAL.
9. ADHESIVE FOR ANCHORS SHALL BE HILTI HIT HY 200 V3 OR APPROVED EQUAL.THREADED RODS SHALL BE HILTI HAS-E STANDARD RODS UNLESS NOTED OTHERWISE.
10. ALL FIELD BOLTS - ASTM A325 HIGH STRENGTH STEEL BOLTS (TYPE "N" U.N.O.).
11. ALL BOLTS 3/4" DIAMETER UNLESS OTHERWISE NOTED OR SHOWN.
12. FIELD TIGHTEN HIGH-STRENGTH BOLTS IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS" (SNUG TIGHT).
13. SPLICES SHALL BE ALLOWED ONLY AT LOCATIONS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS UNLESS APPROVED OTHERWISE BY THE ENGINEER IN WRITING.
14. OVERSIZED OR SLOTTED HOLES SHALL NOT BE USED FOR ANY CONNECTIONS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS OR APPROVED BY THE ENGINEER IN WRITING.
15. PROVIDE HOLES IN ALL STEEL AS REQUIRED TO PREVENT ANY ACCUMULATION OF WATER DURING ERECTION. ALL PENETRATIONS THROUGH MAIN MEMBERS SHALL NOT EXCEED 1 1/2" IN DIAMETER AND SHALL BE GROUND SMOOTH.
16. CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.
17. ALL STEEL MEMBERS TO BE ENCASED IN CONCRETE SHALL BE UNPAINTED ON THE CONTACT SURFACES AND SHALL BE WRAPPED WITH A MINIMUM OF 6X6-W2.9XW2.9 W.W.F. UNLESS NOTED OTHERWISE.
18. ALL BUTT WELDS AT ROLLED SHAPE FLANGES SHALL BE MADE WITH WELD ACCESS HOLES. ACCESS HOLES SHALL BE DRILLED, AND SHALL BE GROUND SMOOTH TO REMOVE ANY JAGGED EDGES.
19. ALL BUTT AND FULL PENETRATION WELDS SHALL BE MADE USING RUN OFF TABS WHICH SHALL BE REMOVED AND GROUND SMOOTH AFTER WELD IS COMPLETED.
20. ALL WELD BACKUP BARS SHALL BE REMOVED AND GROUND SMOOTH AFTER WELDING IS COMPLETE.
21. ALL ENDS OF TUBES OR PIPES SHALL BE SEALED WITH A 1/4" CAP PLATE UNLESS NOTED OTHERWISE.
22. NO HOLES ALLOWED IN BEAMS, JOISTS OR COLUMNS UNLESS SPECIFICALLY NOTED OR DETAILED ON STRUCTURAL DRAWINGS.
23. SHOP PRIME ALL STRUCTURAL STEEL.
24. HOT DIP GALVANIZE ALL STRUCTURAL STEEL COMPONENTS BELOW GRADE.



NOTE: SIGNS AS PER ADAAG STANDARDS

4 C602 WAYFINDING SIGNAGE

NTS

GENERAL PAINT NOTES

1. COLOR AND FINISH: TO BE SUBMITTED FOR VERIFICATION TO OWNER.
2. PRODUCT DATA: FOR EACH TYPE OF PRODUCT. INCLUDE PREPARATION REQUIREMENTS AND APPLICATION INSTRUCTIONS.
3. INCLUDE PRINTOUT OF CURRENT "MPI APPROVED PRODUCTS LIST" FOR EACH PRODUCT CATEGORY SPECIFIED, WITH THE PROPOSED PRODUCT HIGHLIGHTED.
4. INDICATE VOC CONTENT.
5. SAMPLES FOR VERIFICATION: FOR EACH TYPE OF PAINT SYSTEM AND EACH COLOR AND GLOSS OF TOPCOAT
6. APPLY PAINTS ONLY WHEN TEMPERATURE OF SURFACES TO BE PAINTED AND AMBIENT AIR TEMPERATURES ARE BETWEEN 50 AND 95 DEG F.
7. DO NOT APPLY PAINTS IN SNOW, RAIN, FOG, OR MIST; WHEN RELATIVE HUMIDITY EXCEEDS 85 PERCENT; AT TEMPERATURES LESS THAN 5 DEG F ABOVE THE DEW POINT; OR TO DAMP OR WET SURFACES.
8. STEEL SUBSTRATES: REMOVE RUST, LOOSE MILL SCALE, AND SHOP PRIMER IF ANY. CLEAN USING METHODS RECOMMENDED IN WRITING BY PAINT MANUFACTURER PER SSPC-SP 6.
9. SHOP-PRIMED STEEL SUBSTRATES: CLEAN FIELD WELDS, AND AREAS WHERE SHOP PAINT IS ABRADED. PAINT EXPOSED AREAS WITH THE SAME MATERIAL AS USED FOR SHOP PRIMING TO COMPLY WITH SSPC-PA 1 FOR TOUCHING UP SHOP-PRIMED SURFACES.
10. APPLY PAINTS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS IN "MPI ARCHITECTURAL PAINTING SPECIFICATION MANUAL."
11. APPLY PAINTS TO PRODUCE SURFACE FILMS WITHOUT CLOUDINESS, SPOTTING, HOLIDAYS, LAPS, BRUSH MARKS, ROLLER TRACKING, RUNS, SAGS, ROPINESS, OR OTHER SURFACE IMPERFECTIONS. CUT IN SHARP LINES AND COLOR BREAKS.
12. FURNISH EXTRA MATERIALS, FROM THE SAME PRODUCT RUN, THAT MATCH PRODUCTS INSTALLED AND THAT ARE PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING CONTENTS.

5 C602 SIGN DESIGN INTENT

NTS

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = #"
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS

Project No: 124.0187.01

Sheet C602

MARSHALLTOWN, IOWA

2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

LINN CREEK TRAILHEAD

SIGNAGE DETAILS

SNYDER & ASSOCIATES, INC.

SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet C602

V:\Projects\2024\124.0187.01\CAD\SP\B_124018701_TULLY_SIGNAGE DETAILS_20241022_5.00 PM.DWG BRANE T. TULLY, ARCH FULL BLEED D (36.00 X 24.00 INCHES)

SELECTED COLORS:

SHELTER ROOF: DARK BRONZE

SHELTER STRUCTURAL FRAMES: FOX HOLLOW GRAY

2020A

poligon®

PROJECT: MTOWN TRAILHEAD MSL 15

LOCATION: MARSHALTOWN, IA

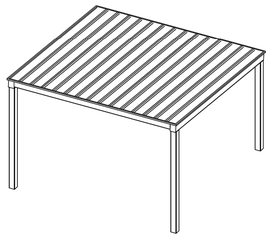
BUILDING TYPE: MSL 15x15

ROOF TYPE: MULTI-RIB

BUILDING NUMBER: P20430

ORDER NUMBER: 80686

QUOTE NUMBER: 18559



DRAWING LIST:

SHEET NUMBER	DRAWING DESCRIPTION
CS	COVER SHEET
1	ARCHITECTURAL ELEVATIONS
2	STRUCTURAL FRAMING PLAN
3	COLUMN LAYOUT

STOP!!
NOT FOR CONSTRUCTION
USE FOR PRELIMINARY PLANNING AND ESTIMATING ONLY

CERTIFICATES:
MIAMI-DADE COUNTY CERTIFICATE OF COMPETENCY NO. 21-0819.13
PCI (POWDER COATING INSTITUTE) 4000 CERTIFIED

FABRICATOR APPROVALS:
CITY OF PHOENIX, AZ APPROVED FABRICATOR #C08-2010
CITY OF LOS ANGELES, CA APPROVED FABRICATOR #FB01596
CITY OF RIVERSIDE, CA APPROVED FABRICATOR #SF_000042
CITY OF HOUSTON, TX APPROVED FABRICATOR #470
CLARK COUNTY, NV APPROVED FABRICATOR #264
STATE OF UTAH APPROVED FABRICATOR 02008-14
AISC APPROVED FABRICATOR C-00018751

MATERIALS:

DESCRIPTION	ASTM DESIGNATION
TUBE STEEL	A500 (GRADE B)
SCHEDULE PIPE	A53 (GRADE B)
RMT PIPE	A519
LIGHT GAGE COLD FORMED	A1003 (GRADE 50)
STRUCTURAL STEEL PLATE	A36
ROOF PANELS (STEEL)	A653

GENERAL NOTES:
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REV LEVEL: A
DRAWN BY: brian.sterken
SCALE: 1:64
PRINT DATE: 9/23/2024
PROJECT NO: P20430
CAD FILE: C:\P20430-80686-PPD

PROJECT: MTOWN TRAILHEAD MSL 15
LOCATION: MARSHALTOWN, IA
SHEET: COVER SHEET

CS

2020A

poligon®

PROJECT:

LOCATION:

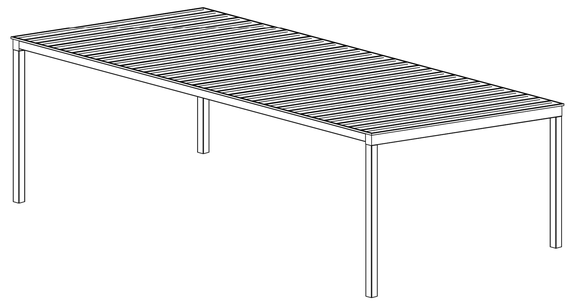
BUILDING TYPE: MSL 16X30

ROOF TYPE: MULTI-RIB

BUILDING NUMBER:

ORDER NUMBER:

QUOTE NUMBER:



DRAWING LIST:

SHEET NUMBER	DRAWING DESCRIPTION
CS	COVER SHEET
1	ARCHITECTURAL ELEVATIONS
2	STRUCTURAL FRAMING PLAN
3	COLUMN LAYOUT

STOP!!
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PCI (POWDER COATING INSTITUTE) 4000 CERTIFIED

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CITY OF LOS ANGELES, CA APPROVED FABRICATOR #FB01596
CITY OF RIVERSIDE, CA APPROVED FABRICATOR #SF_000042
CITY OF HOUSTON, TX APPROVED FABRICATOR #470
CLARK COUNTY, NV APPROVED FABRICATOR #264
STATE OF UTAH APPROVED FABRICATOR 02008-14
AISC APPROVED FABRICATOR C-00018751

MATERIALS:

DESCRIPTION	ASTM DESIGNATION
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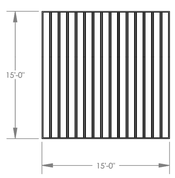
REV LEVEL: A
DRAWN BY: chris.fisac
SCALE: 1:48
PRINT DATE: 12/21/2023
PROJECT NO: 238-NZC
CAD FILE: MSL-16X30

PROJECT: PROJECT LOCATION:
SHEET: COVER SHEET

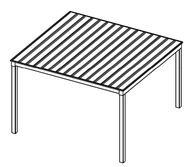
CS

GENERAL ROOF NOTES:

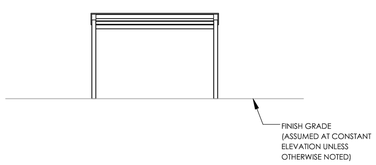
1. METAL ROOFING:
   - 24 GAUGE
   - GALVALUME COATED
   - KYNAR 500 PAINTED
2. TRIM COLOR MATCHES ROOF
3. SEE POLIGON.COM FOR COLOR OPTIONS



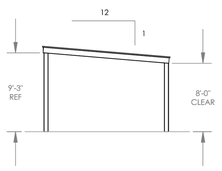
TOP VIEW



ISOMETRIC VIEW



FRONT VIEW



SIDE VIEW

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REV LEVEL: A
DRAWN BY: brian.sterken
SCALE: 1:96
PRINT DATE: 9/23/2024
PROJECT NO: P20430
CAD FILE: C:\P20430-80686-PPD

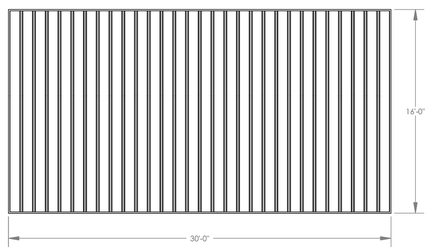
PROJECT: MTOWN TRAILHEAD MSL 15
LOCATION: MARSHALTOWN, IA
SHEET: ARCHITECTURAL ELEVATIONS

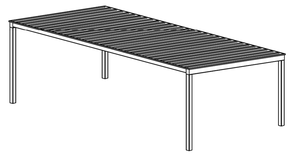
1

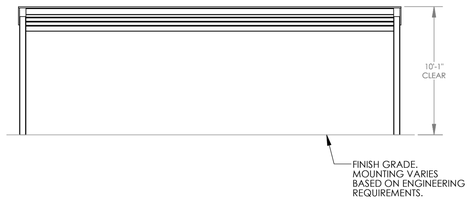
1 / C602 SMALL SHELTER
NTS

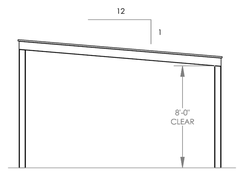
GENERAL ROOF NOTES:

1. METAL ROOFING:
   - 24 GAUGE
   - GALVALUME COATED
   - KYNAR 500 PAINTED
2. TRIM COLOR MATCHES ROOF
3. SEE POLIGON.COM FOR COLOR OPTIONS









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DRAWING: ARCHITECTURAL ELEVATIONS
SCALE: 1:64
REV LEVEL: A

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SHEET 1

2 / C602 LARGE SHELTER
NTS

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = #
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS

Project No: 124.0187.01

Sheet C603

MARSHALLTOWN, IOWA

2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

LINN CREEK TRAILHEAD

SHELTER DETAILS

SNYDER & ASSOCIATES, INC.

SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet C603

V:\Projects\2024\124.0187.01\CADD\SR\R8_124.0187_DTLS.dwg SHANE T. TULLY SHELTER DETAILS 2024/10/22 8:00 PM LARCH FULL BLEED D (36.00 X 24.00 INCHES)

2022A

poligon®

PROJECT: WTOWN TRAILHEAD

LOCATION: MARSHALLTOWN, IA

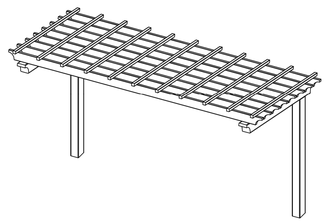
BUILDING TYPE: TRELLIS 7'10"x16'

ROOF TYPE: N/A

BUILDING NUMBER: P20482

ORDER NUMBER: 80937

QUOTE NUMBER: 18502



DRAWING LIST:

SHEET NUMBER	DRAWING DESCRIPTION
CS	COVER SHEET
1	ARCHITECTURAL ELEVATIONS
2	COLUMN LAYOUT

CERTIFICATES:
MIAMI-DADE COUNTY CERTIFICATE OF COMPETENCY NO. 21-0819.13
PCI (POWDER COATING INSTITUTE) 4000 CERTIFIED

FABRICATOR APPROVALS:
CITY OF PHOENIX, AZ APPROVED FABRICATOR #C08-2010
CITY OF LOS ANGELES, CA APPROVED FABRICATOR #FB01596
CITY OF RIVERSIDE, CA APPROVED FABRICATOR #SF_000042
CITY OF HOUSTON, TX APPROVED FABRICATOR #470
CLARK COUNTY, NV APPROVED FABRICATOR #264
STATE OF UTAH APPROVED FABRICATOR 02008-14
AISC APPROVED FABRICATOR C-00018751

MATERIALS:

DESCRIPTION	ASTM DESIGNATION
TUBE STEEL	A500 (GRADE B)
SCHEDULE PIPE	A53 (GRADE B)
RMT PIPE	A519
LIGHT GAGE COLD FORMED	A1003 (GRADE 50)
STRUCTURAL STEEL PLATE	A36
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STOP!!
NOT FOR CONSTRUCTION
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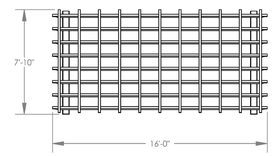
REV LEVEL: A | SCALE: 1:48 | DRAWN BY: brian.sterken | PRINT DATE: 10/9/2024 | PROJ NO: P20482 | CAD NAME: ~P20482-80937-PPD

PROJECT: WTOWN TRAILHEAD | PROJECT LOCATION: MARSHALLTOWN, IA | DRAWING: COVER SHEET | SHEET: CS

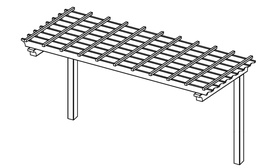
STOP!!
NOT FOR CONSTRUCTION
USE FOR PRELIMINARY PLANNING AND ESTIMATING ONLY

GENERAL ROOF NOTES:

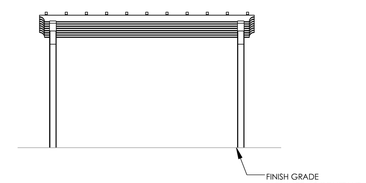
1. METAL ROOFING:
   - 24 GAUGE
   - GALVALUME COATED
   - KYNAR 500 PAINTED
2. TRIM COLOR MATCHES ROOF
3. SEE POLIGON.COM FOR COLOR OPTIONS



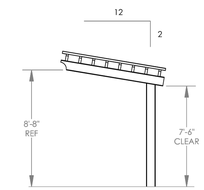
TOP VIEW



ISOMETRIC VIEW



FRONT VIEW



SIDE VIEW

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REV LEVEL: A | SCALE: 1:64 | DRAWN BY: brian.sterken | PRINT DATE: 10/9/2024 | PROJ NO: P20482 | CAD NAME: ~P20482-80937-PPD

PROJECT: WTOWN TRAILHEAD | PROJECT LOCATION: MARSHALLTOWN, IA | DRAWING: ARCHITECTURAL ELEVATIONS | SHEET: 1

SELECTED COLORS:

TRELLIS STRUCTURE FRAME AND OVERHEAD SLATS: FOX HOLLOW GRAY

ANCHOR BOLT LAYOUT NOTES:

1. ENGINEERING WILL DETERMINE REQUIRED ANCHOR BOLT LAYOUT AFTER ENGINEERING PACKAGE IS ORDERED.
2. CUSTOMER MAY SUGGEST PREFERRED ANCHOR BOLT LAYOUT.

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REV LEVEL: A | SCALE: 1:48 | DRAWN BY: brian.sterken | PRINT DATE: 10/9/2024 | PROJ NO: P20482 | CAD NAME: ~P20482-80937-PPD

PROJECT: WTOWN TRAILHEAD | PROJECT LOCATION: MARSHALLTOWN, IA | DRAWING: COLUMN LAYOUT | SHEET: 2

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = #'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS

Project No: 124.0187.01 | Sheet C604

MARSHALLTOWN, IOWA

2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

LINN CREEK TRAILHEAD

OVERHEAD STRUCTURE DETAILS

SNYDER & ASSOCIATES, INC.

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C604

V:\Projects\2024\124.0187.01\CAD\SHEETS\124.0187.01SS-dwg SHANE T. TULLY OVERHEAD STRUCTURE DETAILS 2024/10/22 5:01 PM, ARCH (FULL BLEED) (36.00 X 24.00 INCHES)

MARSHALLTOWN TRAILHEAD RESTROOM

SHEET SCHEDULE	
SHEET	CONTENTS
1	TITLE PAGE & SPECIFICATIONS
2A	FLOOR PLAN & SPECIFICATIONS
2B	ELEVATION VIEWS & SPECIFICATIONS
3	CMU PLAN & DETAILS & SPECIFICATIONS
4	FOUNDATION PLAN & DETAILS, & SPEC'S

ROMTEC

18240 NORTH BANK ROAD - ROSEBURG, OR 97470

(541)-496-3541 FAX (541)-496-0803

MARSHALLTOWN TRAILHEAD
SECTION 13 34 23 - PRE-ENGINEERED RESTROOM BUILDING
Specification Date: 9/9/2024

SECTION 1: BUILDING SUPPLIER SCOPE

1.1. SUMMARY

A. The work shall include furnishing the sealed architectural, structural, mechanical, and electrical plan sets and furnishing the structural, mechanical, and electrical building components as a complete, pre-designed restroom building package as shown on drawings and as specified herein.

1.2. GENERAL REQUIREMENTS

A. Packaged building design and engineering and furnishing all specified building package components shall be supplied by Romtec, Inc., or pre-approved alternate, hereafter designated as the building supplier.

B. The building supplier shall be a single source design, engineering, and manufacturing firm who shall meet all the following requirements.

C. The packaged building shall be a current standard product of building supplier.

D. Building supplier shall be regularly engaged in and have at least ten (10) years of experience in packaged building engineering, design, supply, and construction.

E. The building supplier must meet or exceed the product specifications. The Romtec, Inc. building package is an approved guide and example.

F. Alternate building suppliers shall demonstrate that they have designed, engineered, produced, delivered, and constructed at minimum ten (10) functioning site-built buildings of similar type. Project completion dates and a reference contact from the owner of each project must be provided.

G. Alternate building suppliers must disclose all instances of any prior municipal reviewer or landscape architect's rejection of the same or similar product as an "or equal" to the specified basis of design building package.

H. Bidders who propose and alternate building supplier other than Romtec, Inc. are required to provide a complete submittal package minimum of ten (10) calendar days prior to the bid opening date with full sealed plan sets, calculations, and all pre-engineered structural items.

I. Any products proposed as "or equal" that are not as specified must be specifically listed in the alternate building supplier submittal package and accompanied by manufacturers data sheets for review. These products will be approved or denied prior to the bid opening. Incomplete submittals will be rejected and returned to the bidder.

J. The building and its concrete footings, foundation, and slab are to be engineered by the building supplier to meet site-specific conditions, including wind and snow loading, local frost depth, and ground conditions.

K. Fasteners that are normally included with individual components, as we all any atypical fasteners, shall be supplied by building supplier.

L. Building is to be designed and constructed to meet local codes and approvals for permanent structures. Any building that is temporary, permanently relocatable, prefabricated modular, an offsite constructed product, or constructed of precast material is not an accepted equal to permanent, onsite, conventional construction.

M. No approval by any external entity will override the local building authority's codes and inspections. Seals meant for modular homes and production plant certifications will not be allowed in lieu of sealed plans from a licensed engineer and conventional inspection during construction.

N. Building sidings, treatments, and roofing are to be as specified. Precast buildings with painted textures are not considered architecturally equivalent.

O. The building supplier shall provide complete, code-compliant building plans including plans, elevations, sections, and details, under seal of a National Kitchen and Bathroom Association (NKBA) certified technical designer.

P. The building supplier shall provide complete structural calculations meeting code for design loads and seismic design under seal of a professional Engineer with current license in the state where the project is located.

Q. The reviewing authority reserves the right to review or reject all submittals at its sole discretion.

R. All work and materials shall comply with current industry building codes and regulations for the state where the project is located.

S. Americans with Disabilities Act Accessibility Guidelines (ADAAG) will be followed in design, manufacture, and construction.

1.3. DESIGN & SUBMITTAL DOCUMENTATION

A. The building supplier work shall include the design of the architectural, mechanical, structural, and electrical components that will be required for this building.

B. The building will be designed as a complete building package to be delivered to the job site for construction on-site by the contractor.

C. Within one (1) week of contract award, the building supplier shall submit the packaged building preliminary Scope of Supply and Design Submittal (SSDS), including the building plan view and elevation drawings.

D. The building supplier will provide complete submittal documentation in the building supplier's standard electronic submittal format for review.

E. The preliminary SSDS will be reviewed by relevant parties and returned to the building supplier with any required revisions to the terms, product data sheets, and/or building plan view and elevation drawings noted as comments.

F. The building supplier shall make any required corrections or revisions and resubmit the preliminary SSDS until the preliminary SSDS is approved by the relevant parties.

G. Once the preliminary SSDS has been approved, the building supplier will provide full sealed plan sets stamped by an engineer licensed in the state that the building is located for review by the permitting authority.

H. Up to three (3) wet stamped sets of the plans and structural calculations shall be provided by building supplier before any additional fees apply. Standard plan set size is 11" x 17".

I. Permitting authority will review the full sealed plan set and return with any required revisions or corrections noted as comments.

J. Building supplier shall provide one full round of sealed plan revisions in response to permitting authority comments before any additional fees are allowed.

K. The following sections shall be included in the building supplier's preliminary Scope of Supply and Design Submittal. Incomplete submittals will be rejected and returned to the bidder.

(1) INTRODUCTION

(2) BUILDING DESIGN,

(a) SUPPLIED ITEMS

(b) EXCLUDED ITEMS

(c) PLAN VIEW AND ELEVATION DRAWINGS

(3) PRODUCT DATA

(4) WARRANTY & LIMITATIONS

Note: Overall site plan is not part of building supplier's scope.

1.4. WARRANTY

A. The building package and all associated components provided by building supplier shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from the date of acceptance. Acceptance is the date of delivery of the building package, or, if delivery is delayed for any reason beyond building supplier's control, the date that the building and all its associated components were ready to deliver.

B. Building supplier shall pass through to owner all relevant manufacturers warranties for individual products and components of the building package.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ###

Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS

Project No: 124.0187.01

Sheet C605

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

RESTROOM DETAILS

SNYDER & ASSOCIATES, INC.

2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet C605

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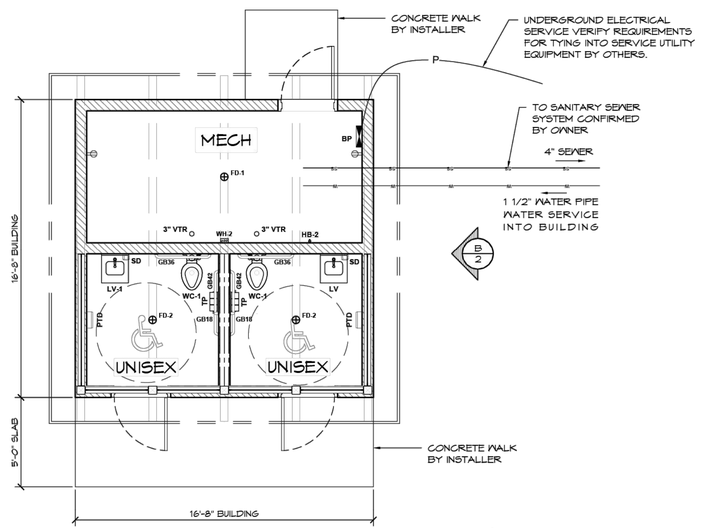
LEGEND		
SYMBOL	DESCRIPTION	AREA/ QUANTITY
	EXTERIOR WALL LIGHTS	3
	INTERIOR CEILING LIGHTS	4

WALL TYPE SCHEDULE

8" REINFORCED CONCRETE MASONRY BLOCK WALL WITH MORTAR JOINTS, GROUTED SOLID ALL CELLS RUNNING BOND PATTERN.



1 FLOOR PLAN
SCALE: 1/4" = 1'-0"

SECTION 2: BUILDING PACKAGE PRODUCTS

2.1. APPROVED BUILDING SUPPLIERS

A. Romtec, Inc.,
18240 North Bank Road, Roseburg, OR 97470
Tel: 541-496-3541; Fax: 541-496-0803; Email: RIsales@romtec.com
Web: www.Romtec.com

B. Requests for use of an alternate building supplier will be considered in accordance with provisions of Section 1.

2.2. BUILDING DESCRIPTION

A. Refer to drawings for quantities, dimensions, locations, and installation methods for the materials and items described in this section.

B. Building dimensions shall match what is indicated on drawings.

2.3. PLUMBING FIXTURES & ACCESSORIES

A. The following plumbing fixtures and accessories shall be supplied by building supplier.

B. Toilet shall be wall mount, top supply, stainless steel.

(1) Flush valve shall be Exposed, Hardwire, Sensor Activated Sloan ECOS® Hardwire Dual Flush Water Closet Flushometer with Smart Sense Technology

C. Lavatory shall be wall mount, stainless steel.

(1) Faucets shall be deck mounted single hole single supply metering, sink faucet.

D. Grab bars shall be stainless steel.

E. Toilet paper dispenser shall be stainless steel, wall mount with three-roll capacity.

F. Surface-mounted towel dispenser shall be fabricated of type heavy duty, 22 gauge stainless steel with exposed surfaces in satin finish. Refill indicator on face of cabinet. Tumbler lock to secure hinged front panel. Towel dispenser capacity 525 multi-fold or 400 C-fold towels.

G. Soap/Sanitizer Dispenser shall be Bradley Corp. Diplomat Series Model 6A01, surface-mounted automatic foam soap/sanitizer dispenser, with face formed with contemporary contours, radii, and finish matching related accessories in manufacturer's designer series. Capacity 27 oz (800 ml). Equipped with hinged cover and completely concealed mounting plate. Vandal resistant filler hole cover and sight gauge. Corrosion-resistant foam soap/sanitizer valve.

2.4. ELECTRICAL

A. The following electrical fixtures shall be supplied by building supplier.

B. Light fixtures shall be supplied by building supplier.

(1) Exterior lights to be LED downlights with cast-aluminum housing with corrosion-resistant paint in dark bronze. Polycarbonate lens.

(2) Exterior lights controlled by photocell.

(3) Interior surface mount, 48" LED light fixtures.

(4) Restroom lights controlled by motion sensor.

(5) Mech room lights controlled by switch (switches by installer).

C. Tankless/electric water heater supplied by building supplier.

D. Main breaker panel shall be supplied by building supplier.

(1) Breaker Panel shall be 100 Amp, single-phase, rain tight.

Note: Breaker panel shall be sized to accept only the loads of the building supplier electrical fixture package. The building supplier should modify the main breaker panel as needed to be most efficient based on any design changes.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##"
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01

Sheet C606

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

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Project No: 124.0187.01
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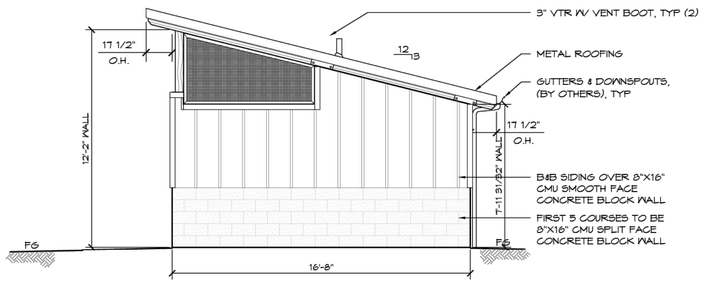


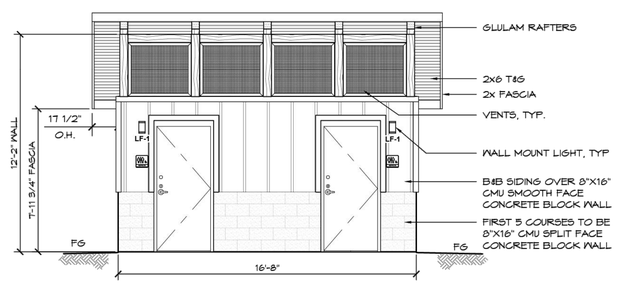
B ELEVATION VIEW

SCALE: 1/4" = 1'-0"

SELECTED EXTERIOR COLORS:

BUILDING ROOF COLOR: BURNISHED SLATE

BUILDING SIDING: CEDAR LAP SIDING



C ELEVATION VIEW

SCALE: 1/4" = 1'-0"

2.5. STRUCTURE

A. Concrete Masonry Units (CMU) shall be supplied by building supplier.

(1) Walls shall be constructed of 8"W x 16"L x 8"H mortar joint concrete masonry units (concrete blocks).

(2) Bottom 5 courses shall be split-face CMU, upper courses shall be smooth-face CMU with siding.

(3) Blocks shall be manufactured to ASTM C90 designation for load bearing concrete masonry units.

(4) Block color to be Gray.

B. Exterior wall finish shall be cedar board and batt siding. siding above exposed split-face CMU.

(1) Siding shall be mounted over OSB sheathing supplied by building supplier.

C. Sanitary tile cove base on interior restroom walls to be supplied by building supplier.

D. Wire weave gable vents for natural ventilation shall be supplied by building supplier.

(1) Pre-assembled steel frame with 10-gauge, 1" square lock joint wire weave mesh integral insect screen.

(2) Steel frame shall be powder coated black.

E. Door system components shall be supplied by building supplier.

(1) Doors shall be Steelcraft® SL18 standard laminated honeycomb core and 18-gauge galvanized steel.

(2) Door frame shall be pre-welded Steelcraft® 3-Sided flush frame, 16-gauge galvannealed A-60 steel.

(3) Doors and frames shall be powder coated black.

(4) Masonry door clips (3/16" dia.) for door frame shall be fitted between the doorframe and concrete blocks to bond frame to wall. Door clips shall allow full internal grouting of the frame during installation.

(5) Hinges shall meet ANSI A5112 with non-removable pin and two ball bearings.

(6) Restroom doors shall have Hager 3700 series interconnected locks with occupancy indicator.

(7) Door lock shall be Grade 2, standard duty commercial cylindrical lever locks with no exposed mounting screws.

(a) Hager 341C latch protection plate with lock cut out.

2.6. ROOFING

A. The following roof components shall be supplied by building supplier.

(1) Glulam beam shall be 24F-V4 and architectural grade.

(2) Tongue & groove decking shall be 2x6 V-edge deck boards, select deck Douglas fir.

B. Roofing shall be Fabral, 26-gauge, Horizon 16, standing seam panels, with 16 in. coverage width.

(1) Roofing package shall include inside and outside foam closures, matching trim (eaves, gables, and ridge) and fasteners, sheet metal flashing (all sides), and 30# felt (under metal).

(2) Roofing color to be selected by the owner from the manufacturers standard color chart.

2.7. DELIVERY, STORAGE, AND HANDLING

A. The building supplier freight shall be based on delivering the product on a 48' to 53' flatbed or van truck and trailers, or as close to those dimensions as can legally access the site. Overall dimensions of the truck and trailers allowed to access the site are: 70' overall length, 102" wide and 168" high.

B. Building supplier shall deliver organized building package components in stages as shrink-wrapped pallets that correspond to a typical sequence of construction. A bill of material stating the stages of palletized components shall be included with every delivery.

(1) Stage 1 pallets shall include structural components such as block, frames, vents, beams, connectors, trusses, etc.

(2) Stage 2 pallets shall include second stage structural components such as filler wall material, windows, skylights, roofing, etc.

(3) Stage 3 pallets shall include structural finish components such as siding material, tile, doors etc.

(4) Stage 4 pallets shall include plumbing and electrical fixtures and other finish materials such as toilets, sinks, drinking fountains, electrical fixtures, accessories, etc.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##"
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS

Project No: 124.0187.01

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SNYDER & ASSOCIATES, INC.

SNYDER & ASSOCIATES

Project No: 124.0187.01

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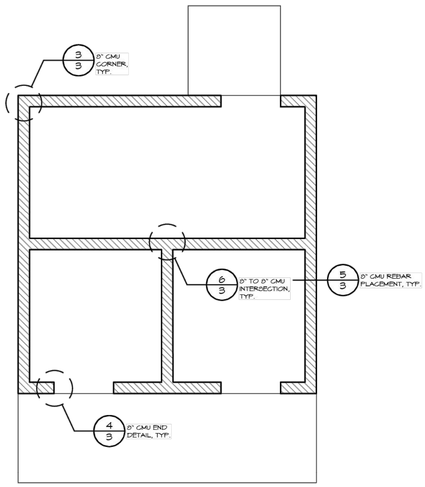
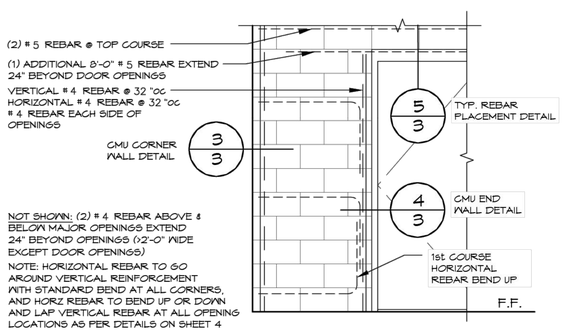


A STRUCTURAL CMU PLAN
SCALE: 1/4" = 1'-0"



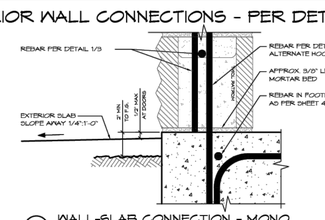
CMU REBAR SCHEDULE		
REBAR	MIN. LAP	BEND DIAMETER
#4	24"	9" MIN.
#5	30"	3-3/4" MIN.

CMU REBAR NOTES:
- BENDS: MIN. INSIDE BEND DIAMETER SHALL BE NOT LESS THAN 6d AS PER TMS 402-16 SECTION 6.1.6.2
- SPLICES: LAP SPLICES ARE PERMITTED AS PER TMS 402-16 SECTION 6.1.6.1.1

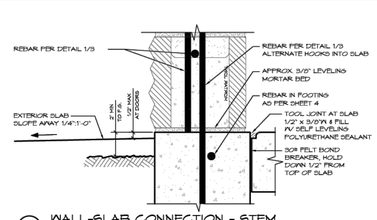
PIPES INSTALLED THROUGH CMU WALL NOTES:
- SUPPLY: THE FIXTURE SUPPLY LINE SHOULD BE BORED A 1/2" LARGER THAN REQUIRED LINE SIZE AND THE PORTION OF PIPE LOCATED IN CMU WALL SHALL BE WRAPPED WITH 10MIL BLACK TAPE
- WASTE PIPE: THE FIXTURE WASTE LINE SHOULD BE BORED A 1/2" LARGER THAN REQUIRED LINE SIZE.

1 CMU REBAR LAYOUT DETAIL
SCALE: 1" = 1'-0"

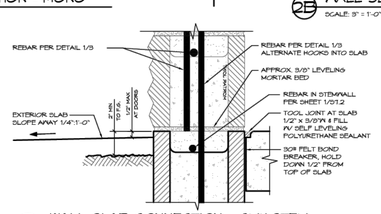
EXTERIOR WALL CONNECTIONS - PER DETAIL 1/4



2A WALL-SLAB CONNECTION - MONO
SCALE: 3" = 1'-0"



2B WALL-SLAB CONNECTION - STEM
SCALE: 3" = 1'-0"



2C WALL-SLAB CONNECTION - CMU STEM
SCALE: 3" = 1'-0"

SECTION 3: BUILDING INSTALLER SCOPE

The installing contractor or subcontractor, hereafter designated as the building installer, is responsible for building package installation. Building installer work will generally include foundation/pad construction and building package assembly/construction.

Note: Building supplier's scope is separate from the building installer's scope. Romtec, Inc., is the approved building supplier, not a designated building installer.

3.1. CONSTRUCTION SUBMITTALS

A. If required by owner and/or reviewing authority, building installer shall submit product data sheets and relevant information about the specified building installer supplied products below for review and approval.

3.2. WARRANTY

A. Building installer's work shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from the date of acceptance. Acceptance is the date that installation work for the building package is completed, including any relevant final punch list. In the event that final acceptance of the completed building is delayed for reasons beyond building installer's control, the warranty shall be one (1) year from the completion of building installer's installation work and demobilization.

B. Building installer shall pass through to owner all relevant manufacturers warranties for individual products and components supplied by building installer.

3.3. STRUCTURE

A. Masonry (concrete) grout shall be supplied and installed by building installer.

(1) Grout shall have a minimum compressive strength of 2,500 psi at 28 days, 9+/-1" slump, with max ½" aggregate.

(2) Fine or coarse grout may be used in accordance with 2009 UBC.

(3) All CMU block must be fully grouted and may not be wetted.

Note: If required for installation, building installer will be responsible for providing appropriate equipment and labor for notching CMU block for bond beams, cutting CMU block to make any required shapes, and/or grinding CMU block for fixture mounting.

B. Rebar for walls shall be supplied and installed by building installer.

(1) All walls shall have # 4 and # 5 rebar. See final approved plans for spacing.

(2) All rebar used in the building must meet ASTM A615 manufacturing standards and is to be placed per the final approved plans.

C. Interior block wall finish shall be latex epoxy paint supplied and installed by building installer.

D. Interior floors to be sealed concrete finish supplied by building installer.

E. Sealant for all exposed wood shall be supplied and installed by building installer.

F. Sealant for all exterior CMU block is required, to be supplied and installed by building installer.

G. Rain gutters and downspouts are supplied and installed by building installer.

3.4. ELECTRICAL

A. Electrical rough-in, installation and trim shall be provided by building installer.

(1) All underground and/or overhead service to building shall be as specified in the final site plan.

(2) Building installer is responsible for all necessary wire, connectors, grounding, conduit, and related items to install the building package electrical components and meet all relevant national, state, and local codes.

(3) Building installer shall supply and install all switches and outlets required to complete the building package installation.

SECTION 4: CONTRACTOR SCOPE ITEMS

The items in this section may be provided by the same building installer as defined in Section 3 above (typically when a single entity is acting as both the building installer and contractor), or the items in this section may be provided by a separate entity such as a general contractor or site contractor, hereafter designated as contractor (typically when the building installer is a separate subcontractor). Contractor work will generally include site preparation and grading, excavations for structures, backfill and/or structural backfill, and any site or utility work outside the building package footprint.

Items in this section are generally to be completed prior to building installer beginning its installation work described in Section 3 above.

4.1. CONSTRUCTION SUBMITTALS

A. If required by owner and/or reviewing authority, contractor shall submit product data sheets and relevant information about the specified contractor supplied products below for review and approval.

4.2. WARRANTY

A. Contractor's work shall be warranted against defects in materials and workmanship for a period of not less than one (1) year from the date of acceptance. Acceptance is the date that installation work for the building package is completed, including any relevant final punch list. In the event that final acceptance of the completed building is delayed for reasons beyond contractor's control, the warranty shall be one (1) year from the completion of contractor's installation work and demobilization.

B. Contractor shall pass through to owner all relevant manufacturers warranties for individual products and components supplied by contractor.

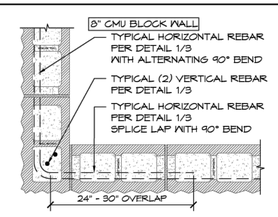
4.3. ELECTRICAL

A. Incoming electrical utility lines to within approximately 10' of the building shall be provided by contractor.

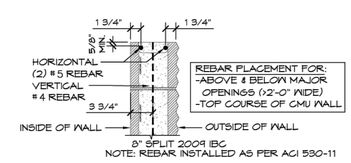
(1) All underground and/or overhead service to building shall be as specified in the final site plan.

(2) Electric meter base and all rough wiring, switches, plugs and circuit breakers shall be as shown on final plans.

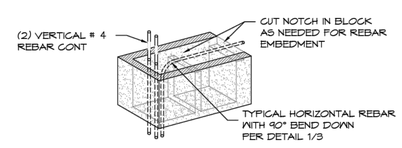
B. Contractor supplies and installs the meter base and meter.



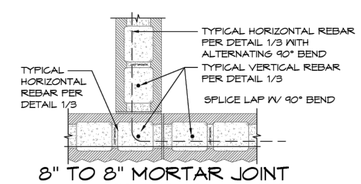
3 MORTAR JOINT CMU CORNER DETAIL
SCALE: 1" = 1'-0"



5 8" CMU REBAR PLACEMENT
SCALE: 1" = 1'-0"



4 MORTAR JOINT CMU WALL END DETAIL
SCALE: 1" = 1'-0"



6 8" TO 8" MORTAR JOINT CMU INTERSECTION DETAIL
SCALE: 1" = 1'-0"

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C608

MARSHALLTOWN, IOWA

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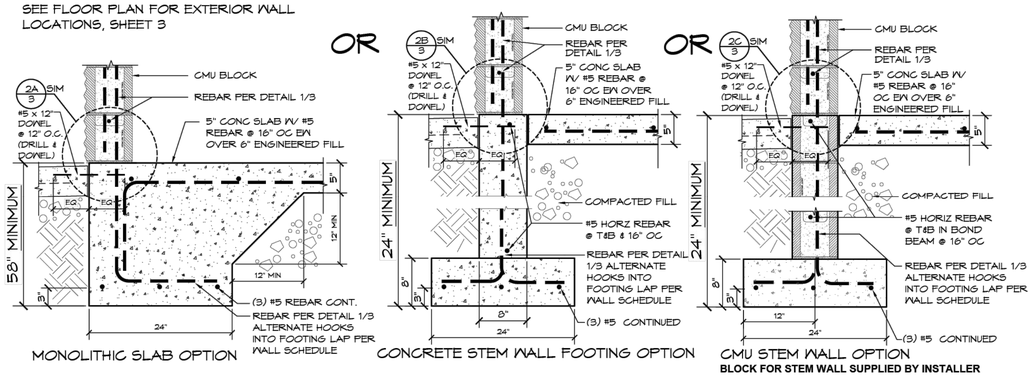
EXTERIOR WALL FOUNDATIONS - CHOOSE ONE OF THE FOLLOWING

SEE FLOOR PLAN FOR EXTERIOR WALL LOCATIONS, SHEET 3

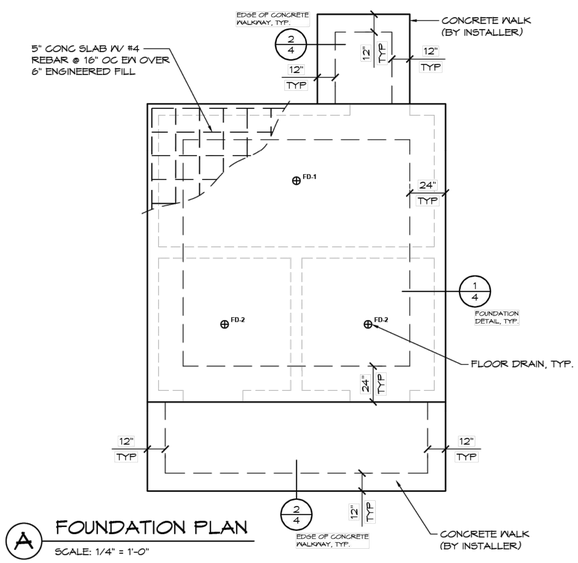


1 EXTERIOR WALL FOUNDATION DETAIL OPTIONS

SCALE: 1" = 1'-0"

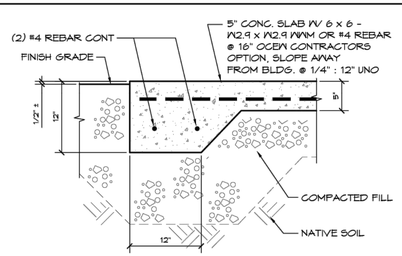
GENERAL NOTES:
* WHEN USING EITHER STEM WALL OPTION RECESS STEM WALL THE THICKNESS OF SLAB AT DOOR THRESHOLD
* PRIVACY WALLS TO HAVE A 30" WIDE x 12" DEEP FOOTING, IF APPLICABLE
* CMU STEM WALL OPTION, CMU BLOCK IS BY INSTALLER
* VERTICAL REBAR IN SLAB/STEM WALL TO MATCH VERTICAL WALL REINFORCEMENT LAP PER WALL SCHEDULE

FOUNDATION DESIGN SHOWN HERE IS PRELIMINARY AND SUBJECT TO CHANGE. FINAL FOUNDATION DESIGN TO BE DETERMINED DURING THE FORTHCOMING FULL DESIGN PHASE FOR THE BUILDING. ANY INCREASED COSTS OR TIME NEEDED TO CONSTRUCT THE FINAL FOUNDATION DESIGN IS BETWEEN THE END OWNER AND THE BUILDING INSTALLER



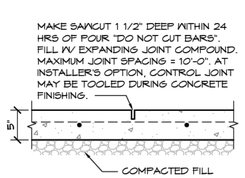
A FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



2 EDGE OF CONC. WALKWAY

SCALE: 1" = 1'-0"



3 SAWCUT JOINT

SCALE: 1" = 1'-0"

3.5. CAST IN-PLACE CONCRETE FOR BUILDING PACKAGE

A. All equipment, labor, trades, and materials for cast-in-place concrete shall be provided by building installer.

(1) Includes all materials and labor for building package foundations/footings and interior slabs.

B. Footings for the building package are to be dug by the building installer and poured on-site to meet local code for permanent structures. A prefabricated, modular mat placed on compacted base is not an accepted equal to a site specific, site poured, engineered foundation.

C. Engineered fill shall be ¾" minus crushed aggregate around footings, foundations, and slabs, or as required in the final approved plans.

D. Slab vapor barrier shall be 6-mil continuous plastic under the concrete slab, or as required in the final approved plans.

E. The foundation shall be installed as designed with all cast in-place concrete poured to dimensions specified, or as required in the final plans.

(1) Footings will be built to minimum 24" depth or greater if required by local frost depth or permitting authority.

(2) Minimum compressive strength of foundation concrete shall be 3,000 psi at 28 days, 4" +/-1" slump, with max ¾" aggregate, cured in accordance with ACI 308, or as required in approved final plans.

(3) Slabs shall have a fine broom finish with joints required in flat work as shown on plans.

(4) Steel rebar shall be installed as specified in final plans.

F. Building installer shall supply and install concrete slab sealer.

(1) Concrete slab sealer shall be a water-based, transparent curing, sealing and dust proofing compound with two (2) coats to be applied per manufacturer's instructions.

3.6. PLUMBING

A. Plumbing rough-in, installation and trim within 10' of the building footprint shall be provided by building installer.

(1) All underground water service and sewer drain(s) from building to be as specified in final approved site plan.

(2) Building water shutoff valve, drain, and all rough piping shall be as shown on final building plans. Final installation location to be determined onsite.

(3) Install the building package plumbing fixtures per the final approved plans.

(4) Piping shall be installed per the final approved plans with minimum pipe sizing per 2009 Uniform Plumbing Code Section 610.

B. Floor drains in the building shall be supplied and installed by building installer.

(1) All floor drains shall be as shown on final approved plans.

3.7. OTHER MATERIALS & EQUIPMENT

A. Unless otherwise specified, the following products and materials are supplied by building installer (if applicable).

(1) Building package installation

(2) Cast-in-place concrete foundations, footings, interior slabs

(3) Concrete slab & block sealer

(4) Mortar

(5) Concrete grout

(6) Rebar

(7) Latex epoxy paint

(8) Caulk for siding

(9) Plumbing rough in, installation and trim

(10) Electrical rough in, installation and trim

(11) Switches & outlets

(12) Typical fasteners; for example: roofing nails, staples, etc.

(13) Fasteners not included in product packaging

(14) Wood sealant for all decking, glulam beams, posts, and extensions

(15) All other items within the building footprint indicated on final plans or required by building codes to complete installation of the building package which are not specifically stated as supplied by building supplier.

3.8. DELIVERY, STORAGE, AND HANDLING

A. The building installer will be responsible for all equipment and labor required for off-loading of the delivered building package onsite.

B. The building installer will assume responsibility for adequate protection and maintenance of delivered building package materials from weather, damage, and pilferage during installation work. Any failure to adequately protect building package materials that affects the warranty of those materials will be at building installer's expense.

C. Building installer shall collect and maintain for final delivery to owner any operation & maintenance manuals included by individual product manufacturers with their respective product packaging. Any failure to collect, maintain, and/or deliver these O&M manuals to the owner that results in fees from building supplier for additional copies shall be at building installer's expense.

4.4. CAST IN-PLACE CONCRETE FOR BUILDING EXTERIOR

A. All equipment, labor, trades, and materials shall be supplied by contractor.

(1) Includes all materials and labor for exterior/entry slabs and sidewalks.

B. Refer to drawings for sidewalks and entry slabs.

(1) Minimum concrete compressive strength of 2,500 psi at 28 days, or as required in final approved plans.

(2) Remesh or rebar reinforcement shall be used in sidewalks.

(3) All sidewalks shall be finished with a fine broom with control joints installed per the final approved site plan.

4.5. PLUMBING

A. Incoming plumbing to within approximately 10' of the building shall be provided by contractor.

(1) All underground water service and sewer drain(s) from building to be as specified in final approved site plan.

(2) Building water shutoff valve is to be supplied and installed by contractor.

(3) Contractor is responsible to ensure that incoming water pressure is sufficient to meet building package fixture demands.

(4) Minimum water pressure at toilet and urinal flush valves shall be 40 psi with minimum pipe sizing as per 2009 Uniform Plumbing Code Section 610, or as required in final approved plans.

B. Water line drain valve shall be supplied and installed by contractor.

C. Sewer line backflow check valve shall be supplied and installed by contractor.

4.6. OTHER MATERIALS & EQUIPMENT

A. Unless otherwise specified, the following products and materials are supplied by contractor.

(1) All items not specifically listed as supplied by building supplier or building installer.

(2) Any item listed as supplied by "contractor" or "others".

B. Unless specified in the plans or submittals, contractor supplies the following items (if applicable):

(1) Incoming electrical, water, sewer, and gas utilities.

(2) Asphalt paving

(3) Masonry pavers

(4) Sidewalks

(5) Landscaping

(6) Site grading

(7) Exterior/entry slabs

(8) Drain valves and backflow check valves

(9) Branch circuit breakers

(10) Irrigation Equipment

(11) Fire alarm and fire suppression equipment

(12) Lighting equipment not attached to the building.

(13) All other items exterior of the building footprint indicated on final plans or required by building codes which are not specifically stated as supplied by building supplier or building installer.

4.7. DELIVERY, STORAGE, AND HANDLING

A. The contractor will assume responsibility for adequate protection and maintenance of the installed building package materials after completion of installation work by building installer. Any failure to adequately protect building package materials that affects the warranty of those materials will be at contractor's expense.

SECTION 5: OWNER'S SCOPE

5.1. ONGOING MAINTENANCE

A. Owner is responsible for ongoing maintenance of the completed building after completion of work by building installer and contractor.

5.2. SITE PLAN

A. Owner (or owner's site engineer) is responsible for providing the final approved site plan to building supplier and/or building installer.

5.3. SPECIAL INSPECTION

A. If required, special inspection(s) services shall be provided by owner.

B. If special inspection(s) are required by the permitting authority or relevant agency(ies), then the building supplier, building installer, and/or contractor shall provide reasonable assistance to the owner to accommodate the special inspection(s).

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1" = ##'
Technician: TKV | Date: 10/22/2024 | T-R-S: TTN-RRW-SS
Project No: 124.0187.01 | Sheet C609

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD
RESTROOM DETAILS

SNYDER & ASSOCIATES, INC.
2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet C609

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ELECTRICAL ABBREVIATIONS

A	DEVICE MOUNTED +8" ABOVE COUNTER TOP (VERIFY LOCATION)	NIC	NOT IN CONTRACT
AFF	ABOVE FINISHED FLOOR	NM	NONMETALLIC
ATS	AUTOMATIC TRANSFER SWITCH	NTS	NOT TO SCALE
C	CEILING	OC	ON CENTER
CB	CIRCUIT BREAKER	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
CT	CURRENT TRANSFORMER	OFOI	OWNER FURNISHED, OWNER INSTALLED
E	EXISTING ITEM TO REMAIN	R	EXISTING ITEM TO BE REMOVED
EC	ELECTRICAL CONTRACTOR	RR	EXISTING ITEM TO BE REMOVED AND RELOCATED
EM	EMERGENCY LIGHT FIXTURE	RN	EXISTING ITEM TO BE REMOVED AND REPLACED WITH NEW
ER	NEW LOCATION OF EXISTING ITEM	SCCR	SHORT CIRCUIT CURRENT RATING
F	ROUGH IN FOR FUTURE DEVICE	T	TAMPER PROOF DEVICE
FAAP	FIRE ALARM ANNUNCIATOR PANEL	TCC	TEMPERATURE CONTROL CONTRACTOR
FACP	FIRE ALARM CONTROL PANEL	TV	TELEVISION
FSD	FIRE SMOKE DAMPER	TYP	TYPICAL
G	GROUND FAULT CIRCUIT INTERRUPTER	UPS	UNINTERRUPTIBLE POWER SUPPLY
GND	GROUND	V	VOLTS
KVA	KILO-VOLT-AMPERES	VA	VOLT-AMPERES
KW	KILOWATTS	WG	WIREGUARD COVER
MC	MECHANICAL CONTRACTOR	WP	WEATHERPROOF DEVICE
MCB	MAIN CIRCUIT BREAKER	WR	WEATHER RESISTANT DEVICE
MDP	MAIN DISTRIBUTION PANEL	+24"	INDICATES MOUNTING HEIGHT CENTER LINE OF DEVICE TO FINISHED FLOOR
MLO	MAIN LUGS ONLY		
N	NEW DEVICE IN EXISTING LOCATION		

GENERAL NOTES - ELECTRICAL

1. COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. BEGIN INSTALLATION AND ROUGH-IN ONLY AFTER PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION IS COMPLETE. COORDINATE WITH BUILDING STRUCTURE, ARCHITECTURE, MECHANICAL SHEET METAL, ALL PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, EQUIPMENT ACCESS/CLEARANCE, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT. CONTRACTOR IS RESPONSIBLE FOR REWORK OF INSTALLED EQUIPMENT RESULTING FROM INSUFFICIENT COORDINATION.

2. ELECTRICAL DRAWINGS ARE ONLY A PORTION OF THE COMPLETE SET OF PLANS AND CONTRACT DOCUMENTS. THE ELECTRICAL SCOPE OF WORK IS DEFINED BY THE COMPLETE SET OF CONTRACT DOCUMENTS. THIS INCLUDES BUT IS NOT LIMITED TO REFERENCING; ARCHITECTURAL PLANS FOR DIMENSIONS AND DETAILS; EQUIPMENT PLANS FOR ROUGH-IN REQUIREMENTS, MECHANICAL PLANS FOR EQUIPMENT SIZES AND LOCATIONS.

INSTALLATION NOTES - ELECTRICAL

1. INCREASE CONDUCTOR SIZES ON 20A 120V-1 PHASE CIRCUITS EXCEEDING 100 FEET TO CENTER OF LOAD TO ACCOUNT FOR VOLTAGE DROP.

2. RACEWAYS AND BOXES ARE SHOWN DIAGRAMMATICALLY ONLY AND INDICATE GENERAL AND APPROXIMATE LOCATIONS. LAYOUTS DO NOT ALWAYS SHOW THE TOTAL NUMBER OF RACEWAYS OR BOXES FOR THE CIRCUITS REQUIRED, NOR ARE THE LOCATIONS OF INDICATED RUNS INTENDED TO SHOW THE ACTUAL ROUTING OF THE RACEWAYS.

3. LIGHT FIXTURES, SWITCHES, DEVICES, ETC. ARE SHOWN IN PREFERRED LOCATION. MODIFY CONDUIT, HANGERS, CIRCUITING, ETC. TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.

4. PROVIDE A DEDICATED GREEN INSULATED GROUND CONDUCTOR TO ALL DEVICES. DO NOT USE CONDUIT SYSTEM AS THE ONLY EQUIPMENT GROUNDING METHOD.

5. DO NOT INSTALL BOXES BACK-TO-BACK ON OPPOSITE SIDES OF THE SAME WALL. MAINTAIN MINIMUM OF 8" DISTANCE BETWEEN BOXES WHEREVER APPLICABLE.

6. BALANCE PANEL LOADS DURING INSTALLATION. CIRCUIT NUMBERING SHOWN ON PLANS MAY BE ADJUSTED TO ACCOMMODATE.

7. PROVIDE TYPED PANEL DIRECTORY AT PROJECT COMPLETION FOR NEW PANELS AND EXISTING PANELS WITH CIRCUITS MODIFIED DURING PROJECT. USE OWNER'S CURRENT ROOM NUMBERS AND EQUIPMENT NAMES. PROVIDE UNIQUE CIRCUIT IDENTIFICATION PER NEC 408.4(A)

8. CONTRACTOR IS RESPONSIBLE FOR OPENINGS IN WALLS, FLOORS, CEILINGS, AND ROOFS THAT ARE REQUIRED TO COMPLETE THEIR SCOPE OF WORK. SEAL PENETRATIONS IN ACCORDANCE WITH THE RATING OF THE AFFECTED ASSEMBLY. REFER TO ARCHITECTURAL CODE PLAN FOR RATED WALLS, FLOORS, AND CEILINGS.

CODE NOTES - ELECTRICAL

1. PROVIDE ELECTRICAL INSTALLATION IN ACCORDANCE WITH ALL LOCAL, STATE, AND NATIONAL CODES.

2. THE CURRENT ADOPTED EDITION OF THE ELECTRICAL CODE IS THE STANDARD FOR THE ELECTRICAL INSTALLATION. VERIFY WITH LOCAL OFFICIALS WHEN PERMITS ARE OBTAINED. NOTIFY DESIGN TEAM OF ANY DISCREPANCIES BETWEEN THE PROJECT MANUAL OR DRAWINGS AND THE GOVERNING CODE.

3. INSTALLATION SHALL FOLLOW REQUIREMENTS OF THE ADAAG --AMERICANS WITH DISABILITIES ACT.

4. REFER TO PROJECT MANUAL AND PROJECT CODE REVIEW SHEET FOR LIST OF APPLICABLE CODES.

5. PER NEC EVERY CIRCUIT AND CIRCUIT MODIFICATION SHALL BE LEGIBLY IDENTIFIED AS TO ITS CLEAR, EVIDENT AND SPECIFIC PURPOSE OR USE. CONTRACTOR TO PROVIDE FINAL CIRCUIT IDENTIFICATION FOR ALL NEW AND MODIFIED CIRCUITS AT PROJECT COMPLETION.

INSTALLATION NOTES - SYSTEMS

1. REFER TO TECHNOLOGY SERIES SHEETS FOR ROUGH-IN REQUIREMENTS.

2. REFER TO ELECTRICAL/TECHNOLOGY SCOPE OF RESPONSIBILITY MATRIX.

DEVICE INSTALLATION AND MATERIALS - ELECTRICAL

1. PROVIDE NORMAL WIRING DEVICES AS WHITE, UNLESS OTHERWISE NOTED.

2. PROVIDE DEVICES COVER PLATES AS STAINLESS STEEL. MATCH WIRING DEVICES COLOR.

3. PROVIDE GFCI TYPE RECEPTACLES AT ALL LOCATIONS REQUIRED BY THE NEC.

4. INSTALL WALL MOUNTED RECEPTACLES AT +18" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.

5. INSTALL WALL MOUNTED LIGHT SWITCHES AT +46" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. EXCEPTION; INSTALL DEVICES ABOVE AN OBSTRUCTED HIGH FORWARD REACH OBSTACLE GREATER THEN 20 INCHES IN DEPTH AT +42".

6. INSTALL ABOVE COUNTERTOP RECEPTACLES +8" ABOVE COUNTERTOP OR AS OTHERWISE INDICATED.

7. AT A COMMON COUNTERTOP, INSTALL ALL RECEPTACLES AND SWITCHES AT THE SAME HEIGHT UNLESS OTHERWISE SPECIFICALLY INDICATED.

GENERAL SYMBOLS

- CONDUIT SLEEVE
- CONDUIT UP, REFER TO TAG ON DRAWING FOR SIZE
- CONDUIT DOWN, REFER TO TAG ON DRAWING FOR SIZE
- J — JUNCTION BOX, CEILING OR FLOOR MOUNTED.
- J — JUNCTION BOX, WALL MOUNTED, ELEVATION AS NOTED.
- CIRCUIT HOMERUN, CONCEALED CONDUIT OR CABLE
- CIRCUIT HOMERUN, UNDER FLOOR CONDUIT OR CABLE
- # — KITCHEN EQUIPMENT TAG NUMBER, REFER TO KITCHEN EQUIPMENT CONNECTION SCHEDULE
- # — KEYNOTE
- XXX / X — EQUIPMENT IDENTIFICATION TAG. REFER TO EQUIPMENT CONNECTION SCHEDULE
- 1 / A101 SIM — DETAIL DRAWING REFERENCE TAG, SIM-SIMILAR, TYP-TYPICAL, OPP-OPPOSITE / SHEET REFERENCE
- 1 / A101 SIM — SECTION CUT REFERENCE TAG, SIM-SIMILAR, TYP-TYPICAL, OPP-OPPOSITE / SHEET REFERENCE
- A101 / 1 Ref — INTERIOR ELEVATION DRAWING REFERENCE TAG

LIGHTING SYMBOLS

- SURFACE MOUNTED STRIP FIXTURE
- INDUSTRIAL STRIP LIGHT FIXTURE
- EMERGENCY LIGHT FIXTURE, WALL MOUNT, +96" OR AS NOTED
- EMERGENCY LIGHT FIXTURE, CEILING MOUNT
- EXTERIOR POLE MOUNTED LIGHT FIXTURE, REFER TO LIGHT FIXTURE SCHEDULE
- BOLLARD LIGHT FIXTURE
- EXTERIOR FLOOD LIGHT FIXTURE, REFER TO LIGHT FIXTURE SCHEDULE
- $ a — SINGLE POLE SWITCH, WALL MOUNT, LETTER INDICATES SWITCH LEG
- $3 b — THREE WAY SWITCH, WALL MOUNT, LETTER INDICATES SWITCH LEG
- LC — LIGHTING CONTRACTOR
- R — RELAY
- PC — PHOTOCELL

POWER SYMBOLS

- SINGLE RECEPTACLE, WALL MOUNTED
- DUPLEX RECEPTACLE, CEILING MOUNTED
- DUPLEX RECEPTACLE, WALL MOUNTED, TAMPER-RESISTANT
- G — DUPLEX GFCI RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT, "G" INDICATES PROTECTION INCLUDED IN DEVICE. SHADING INDICATES DEVICE PROTECTED BY EITHER UPSTREAM GFCI DEVICE OR CIRCUIT BREAKER
- EWC — DUPLEX RECEPTACLE, MOUNTED WITHIN WATER COOLER HOUSING, VERIFY HEIGHT. CONNECT TO GFCI, CIRCUIT BREAKER OR REMOTE WALL DEVICE. SHADING INDICATES GFCI PROTECTED DEVICE
- W — DUPLEX GFCI WEATHER RESISTANT RECEPTACLE WITH WEATHER-PROOF IN-USE COVER, TAMPER-RESISTANT, WALL MOUNT
- QUADRAPLEX RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT +18", OR AS NOTED
- G — QUADRAPLEX GFCI RECEPTACLE, TAMPER-RESISTANT, WALL MOUNT, "G" INDICATES PROTECTION INCLUDED IN DEVICE. SHADING INDICATES DEVICE PROTECTED BY EITHER UPSTREAM GFCI DEVICE OR CIRCUIT BREAKER
- SPECIAL RECEPTACLE, WALL MOUNT, REFER TO EQUIPMENT CONNECTION SCHEDULE FOR RECEPTACLE TYPE. REFER TO PANEL SCHEDULES FOR GFCI PROTECTION WHERE REQUIRED
- SPECIAL RECEPTACLE, CEILING MOUNT, REFER TO EQUIPMENT CONNECTION SCHEDULE FOR RECEPTACLE TYPE. REFER TO PANEL SCHEDULES FOR GFCI PROTECTION WHERE REQUIRED
- EQUIPMENT CONNECTION, REFER TO EQUIPMENT CONNECTION SCHEDULE FOR CONNECTION TYPE. REFER TO PANEL SCHEDULES FOR GFCI PROTECTION WHERE REQUIRED
- MOTOR CONNECTION, REFER TO EQUIPMENT CONNECTION SCHEDULE FOR CONNECTION TYPE. REFER TO PANEL SCHEDULES FOR GFCI PROTECTION WHERE REQUIRED
- EQUIPMENT CONNECTION, WALL MOUNT, REFER TO EQUIPMENT CONNECTION SCHEDULE FOR CONNECTION TYPE. REFER TO PANEL SCHEDULES FOR GFCI PROTECTION WHERE REQUIRED
- SAFETY DISCONNECT SWITCH
- G — BLANK FACE GFCI DEVICE, WALL MOUNT +48", OR AS NOTED
- DOOR PUSH BUTTON (WEATHERPROOF), +48" OR AS NOTED
- GROUND BAR
- T — UTILITY TRANSFORMER
- M — UTILITY METER
- SPD — SURGE PROTECTIVE DEVICE
- PANELBOARD - SURFACE MOUNTED
- PANELBOARD - RECESSED IN WALL
- GROUND RING

KCL ENGINEERING
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West Des Moines, IA
50265
515-724-7938

MARK	REVISION	DATE	BY

Architect: Checker | Checked By: Checker | Scale: As indicated
Technician: Author | Date: 10/10/2024 | T-R-S: 82-7-33

Project No: 124.0187.01 | Sheet E000

MARSHALLTOWN, IOWA

2727 S.W. SNYDER BLVD
ANKENY, IOWA 50023
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MARSHALLTOWN LINN CREEK TRAILHEAD

ELECTRICAL GENERAL NOTES & SYMBOLS

SNYDER & ASSOCIATES, INC.
SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet E000

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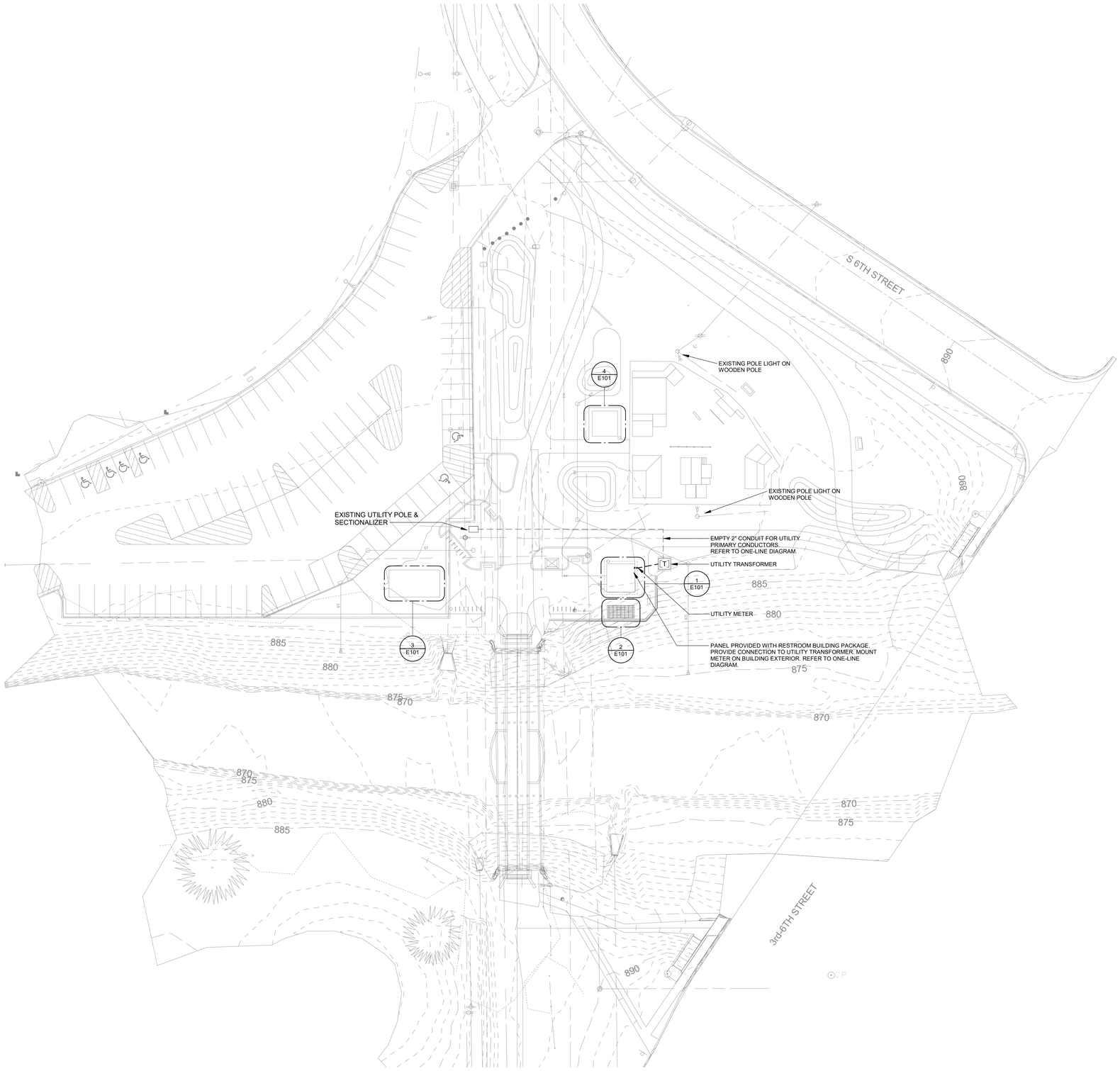

1 ELECTRICAL SITE UTILITY & REFERENCE PLAN
1" = 30'-0"

SITE GENERAL NOTES

A. UTILITIES SHOWN ON ELECTRICAL SITE PLAN ARE SCHEMATIC ONLY. ALL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE UNLESS DIMENSIONED. VERIFY ALL SITE CONDITIONS AND DIMENSIONS ON SITE.

B. PROVIDE TRENCHING, PULL BOXES, BACKFILL, AND PATCHWORK AS REQUIRED TO COMPLETE SITE ELECTRICAL INSTALLATION.

C. REFER TO ELECTRIC AND LOW VOLTAGE UTILITY ENGINEERED DRAWINGS FOR ADDITIONAL CONDUITS, BOXES, AND ROUTING REQUIREMENTS. COORDINATE POLES, PADS, PRIMARY CABLE, TRANSFORMERS, METERS PEDESTALS, ETC.

D. COORDINATE ROUTING AND CRITICAL CROSSING POINTS OF ELECTRICAL CONDUITS WITH CIVIL AND UTILITY CONTRACTORS. ADJUST CONDUIT DEPTH AS REQUIRED.

E. REPAIR ALL AFFECTED SURFACES AND RESTORE TO EXISTING CONDITIONS AT COMPLETION OF PROJECT.

F. PROVIDE ALL SITE CONDUIT AS 1" MINIMUM, ALL CONDUCTORS AS #10 AWG CU. MINIMUM.

G. WARNING - CALL BEFORE YOU DIG: LAW REQUIRES ANYONE DOING EXCAVATION, FENCING, PLANTING OR DRILLING TO CALL 48 HOURS IN ADVANCE. HAND DIG WITHIN 18 INCHES OF ANY LOCATE MARK OR FLAG. ONE-CALL 811

IOWA ONE CALL
1-800-292-8989
CALL - BEFORE - YOU - DIG

CALL 811 BEFORE YOU DIG
811
SAFE DIGGING PARTNER

GENERAL NOTE:

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN SHOWN BASED UPON INFORMATION OBTAINED FROM FIELD LOCATIONS BY UTILITY COMPANIES, AVAILABLE SURVEYS AND RECORDS. THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS ALSO POSSIBLE THAT THERE MAY BE OTHER UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES IN EXISTENCE THAT ARE NOT SHOWN. IT IS THE RESPONSIBILITY OF EACH INDIVIDUAL PARTY REFERENCING THIS PLAN TO DETERMINE THE EXACT LOCATION AND TYPE OF UNDERGROUND FACILITIES ON THE SITE. HAND EXCAVATE AT CRITICAL POINTS AS NECESSARY TO VERIFY LOCATIONS, SIZES, ELEVATIONS, FLOW LINES, ETC. IF A PROBLEM OR INTERFERENCE EXISTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING.

MARK	REVISION	DATE	BY

Architect: NS | Checked By: NS | Scale: As indicated
Technician: TK | Date: 10/10/2024 | T-R-S: 82-7-33

Project No: 124.0187.01

Sheet E001

MARSHALLTOWN LINN CREEK TRAILHEAD

MARSHALLTOWN, IOWA

ELECTRICAL SITE UTILITY & REFERENCE PLAN

SNYDER & ASSOCIATES, INC.
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Project No: 124.0187.01
Sheet E001

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1 ELECTRICAL SITE LIGHTING PLAN
1" = 30'-0"

SITE GENERAL NOTES

A. UTILITIES SHOWN ON ELECTRICAL SITE PLAN ARE SCHEMATIC ONLY. ALL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE UNLESS DIMENSIONED. VERIFY ALL SITE CONDITIONS AND DIMENSIONS ON SITE.

B. PROVIDE TRENCHING, PULL BOXES, BACKFILL, AND PATCHWORK AS REQUIRED TO COMPLETE SITE ELECTRICAL INSTALLATION.

C. REFER TO ELECTRIC AND LOW VOLTAGE UTILITY ENGINEERED DRAWINGS FOR ADDITIONAL CONDUITS, BOXES, AND ROUTING REQUIREMENTS. COORDINATE POLES, PADS, PRIMARY CABLE, TRANSFORMERS, METERS PEDESTALS, ETC.

D. COORDINATE ROUTING AND CRITICAL CROSSING POINTS OF ELECTRICAL CONDUITS WITH CIVIL AND UTILITY CONTRACTORS. ADJUST CONDUIT DEPTH AS REQUIRED.

E. REPAIR ALL AFFECTED SURFACES AND RESTORE TO EXISTING CONDITIONS AT COMPLETION OF PROJECT.

F. PROVIDE ALL SITE CONDUIT AS 1" MINIMUM, ALL CONDUCTORS AS #10 AWG CU. MINIMUM.

G. WARNING - CALL BEFORE YOU DIG: LAW REQUIRES ANYONE DOING EXCAVATION, FENCING, PLANTING OR DRILLING TO CALL 48 HOURS IN ADVANCE. HAND DIG WITHIN 18 INCHES OF ANY LOCATE MARK OR FLAG. ONE-CALL 811

IOWA ONE CALL
1-800-292-8989
CALL - BEFORE - YOU - DIG

CALL 811 BEFORE YOU DIG
811
SAFE DIGGING PARTNER

GENERAL NOTE:

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN SHOWN BASED UPON INFORMATION OBTAINED FROM FIELD LOCATIONS BY UTILITY COMPANIES, AVAILABLE SURVEYS AND RECORDS. THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS ALSO POSSIBLE THAT THERE MAY BE OTHER UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES IN EXISTENCE THAT ARE NOT SHOWN. IT IS THE RESPONSIBILITY OF EACH INDIVIDUAL PARTY REFERENCING THIS PLAN TO DETERMINE THE EXACT LOCATION AND TYPE OF UNDERGROUND FACILITIES ON THE SITE. HAND EXCAVATE AT CRITICAL POINTS AS NECESSARY TO VERIFY LOCATIONS, SIZES, ELEVATIONS, FLOW LINES, ETC. IF A PROBLEM OR INTERFERENCE EXISTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING.

MARK	REVISION	DATE	BY

Architect: NS | Checked By: NS | Scale: As indicated
Technician: TK | Date: 10/10/2024 | T-R-S: 82-7-33
Project No: 124.0187.01 | Sheet E002

MARSHALLTOWN LINN CREEK TRAILHEAD

MARSHALLTOWN, IOWA

ELECTRICAL SITE LIGHTING PLAN

SNYDER & ASSOCIATES, INC.
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ANKENY, IOWA 50023
515-964-2020 | www.snyder-associates.com

SNYDER & ASSOCIATES

KCL ENGINEERING
300 4th St
West Des Moines, IA
50265
515-724-7938

Project No: 124.0187.01
Sheet E002

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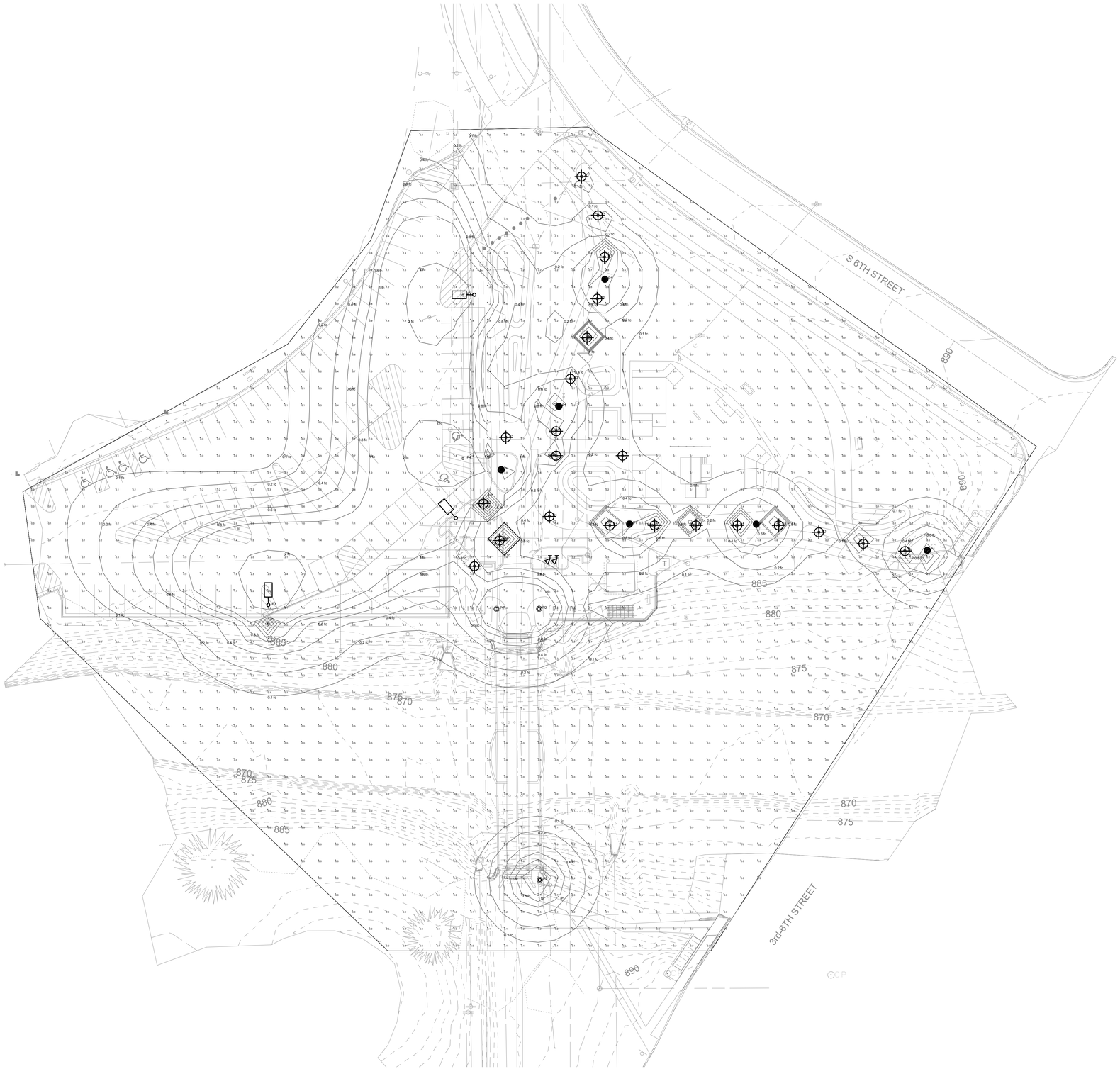

1 ELECTRICAL SITE PHOTOMETRIC PLAN
1" = 30'-0"

SITE GENERAL NOTES

A. UTILITIES SHOWN ON ELECTRICAL SITE PLAN ARE SCHEMATIC ONLY. ALL LOCATIONS SHOULD BE CONSIDERED APPROXIMATE UNLESS DIMENSIONED. VERIFY ALL SITE CONDITIONS AND DIMENSIONS ON SITE.

B. PROVIDE TRENCHING, PULL BOXES, BACKFILL, AND PATCHWORK AS REQUIRED TO COMPLETE SITE ELECTRICAL INSTALLATION.

C. REFER TO ELECTRIC AND LOW VOLTAGE UTILITY ENGINEERED DRAWINGS FOR ADDITIONAL CONDUITS, BOXES, AND ROUTING REQUIREMENTS. COORDINATE POLES, PADS, PRIMARY CABLE, TRANSFORMERS, METERS PEDESTALS, ETC.

D. COORDINATE ROUTING AND CRITICAL CROSSING POINTS OF ELECTRICAL CONDUITS WITH CIVIL AND UTILITY CONTRACTORS. ADJUST CONDUIT DEPTH AS REQUIRED.

E. REPAIR ALL AFFECTED SURFACES AND RESTORE TO EXISTING CONDITIONS AT COMPLETION OF PROJECT.

F. PROVIDE ALL SITE CONDUIT AS 1" MINIMUM, ALL CONDUCTORS AS #10 AWG CU. MINIMUM.

G. WARNING - CALL BEFORE YOU DIG: LAW REQUIRES ANYONE DOING EXCAVATION, FENCING, PLANTING OR DRILLING TO CALL 48 HOURS IN ADVANCE. HAND DIG WITHIN 18 INCHES OF ANY LOCATE MARK OR FLAG. ONE-CALL 811

IOWA ONE CALL
1-800-292-8989
CALL - BEFORE - YOU - DIG

CALL 811 BEFORE YOU DIG
811
SAFE DIGGING PARTNER

GENERAL NOTE:

UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN SHOWN BASED UPON INFORMATION OBTAINED FROM FIELD LOCATIONS BY UTILITY COMPANIES, AVAILABLE SURVEYS AND RECORDS. THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS ALSO POSSIBLE THAT THERE MAY BE OTHER UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES IN EXISTENCE THAT ARE NOT SHOWN. IT IS THE RESPONSIBILITY OF EACH INDIVIDUAL PARTY REFERENCING THIS PLAN TO DETERMINE THE EXACT LOCATION AND TYPE OF UNDERGROUND FACILITIES ON THE SITE. HAND EXCAVATE AT CRITICAL POINTS AS NECESSARY TO VERIFY LOCATIONS, SIZES, ELEVATIONS, FLOW LINES, ETC. IF A PROBLEM OR INTERFERENCE EXISTS, NOTIFY ARCHITECT/ENGINEER BEFORE PROCEEDING.

LUMINAIRE SCHEDULE

SYMBOL	QTY	TAG	ARRANGEMENT	DESCRIPTION	LLF	LUMENS	WATTS	TOTAL WATTS
	21	B1	Single	JE-10555-M-8040 BOLLARD	0.900	1618	13.7	287.7
	6	P1	Single	USM-21121-R@8W@LIGHT COLUMN	0.900	3860	55.7	334.2
	3	P2	Single	CGT01-HE-LO	0.900	2233	40.8002	122.401
	2	P3	Single	DSX0 LED P6 40K 70CRI T3M ON 25FT POLE	0.900	17134	137	274
	1	P4	Single	DSX0 LED P6 40K 70CRI T4M ON 25FT POLE	0.900	17289	137	137

CALCULATION SUMMARY

LABEL	CALC TYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN	MAX/AVG	# PTS
GROUND_Top	Illuminance	Fc	0.33	12.5	0.0	N.A.	N.A.	N.A.	1835

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MARK	REVISION	DATE	BY

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Project No: 124.0187.01 | Sheet E003

MARSHALLTOWN LINN CREEK TRAILHEAD

MARSHALLTOWN, IOWA

ELECTRICAL SITE PHOTOMETRIC PLAN

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Project No: 124.0187.01
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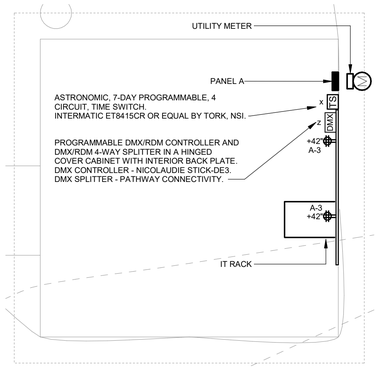
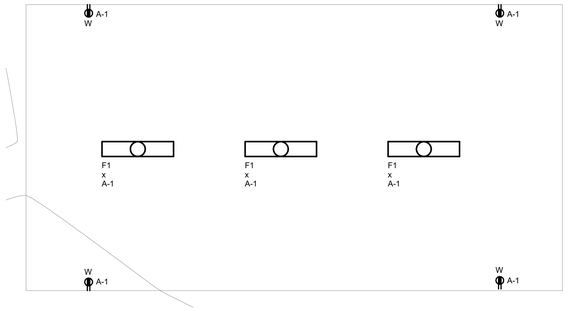
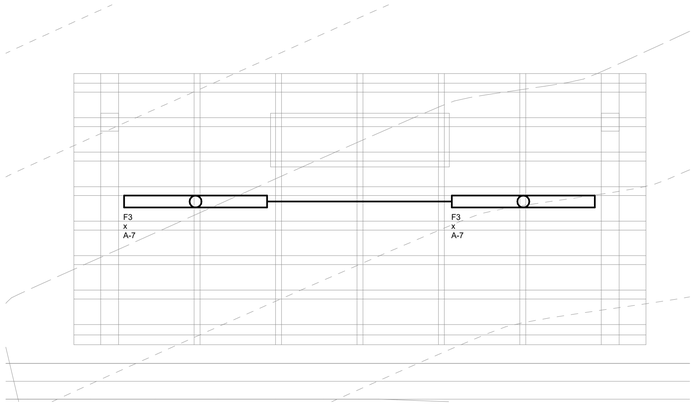


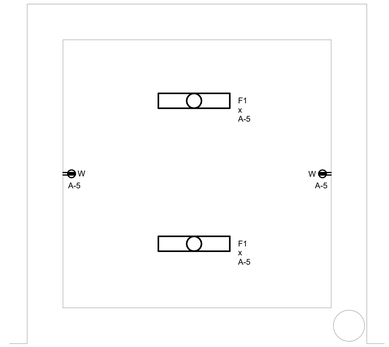
1 ENLARGED ELECTRICAL PLAN - ROMTEC RESTROOM BUILDING
1/4" = 1'-0"



3 ENLARGED ELECTRICAL PLAN - LARGE SHELTER
1/4" = 1'-0"



2 ENLARGED ELECTRICAL PLAN - OVERLOOK
1/2" = 1'-0"



4 ENLARGED ELECTRICAL PLAN - SMALL SHELTER
1/4" = 1'-0"

POWER GENERAL NOTES

A. COORDINATE LOCATION/INSTALLATION OF MECHANICAL AND ELECTRICAL WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION HAS TRANSPIRED. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.

B. COORDINATE ELECTRICAL REQUIREMENTS FOR MECHANICAL UNITS WITH MECHANICAL CONTRACTOR AND FINAL MECHANICAL SHOP DRAWINGS.

C. PROVIDE PENETRATIONS REQUIRED FOR ROUTING RACEWAYS THROUGH THE BUILDING. COORDINATE FIRE RATED WALL PENETRATIONS AND PROVIDE CONDUIT SLEEVES AND FIRE STOPPING TO MAINTAIN RATING.

BRANCH PANEL: A

LOCATION:
SUPPLY FROM: UTILITY METER
MOUNTING: SURFACE
ENCLOSURE: TYPE 1

VOLTAGE: 120/240 SINGLE ϕ
PHASES: 1
WIRES: 3

SCCR RATING: 10,000 A
MAINS TYPE: MCB
MAINS RATING: 100 A
MCB RATING: 100 A

NOTES:

CIRCUIT DESCRIPTION	P	AMP	CKT NO	A		B		CKT NO	AMP	P	CIRCUIT DESCRIPTION
LARGE SHELTER - LIGHTING AND RECEPTACLES	1	20 A	1	780				2			
RECEPTACLE - IT RACK	1	20 A	3			720		4			
SMALL SHELTER - LIGHTING AND RECEPTACLES	1	20 A	5	400				6			
LIGHTING OVERLOOK	1	20 A	7			48		8			
LIGHTING - EXTERIOR	1	20 A	9	1196				10			
			11					12			
			13					14			
			15					16			
			17					18			
			19					20			
			21					22			
			23					24			
			25					26			
			27					28			
			29					30			
				2,376 VA		768 VA					
				20 A		6 A					

LEGEND:
"G" INDICATES GFCI TYPE BREAKER, "L" INDICATES PROVIDE LOCKABLE HASP
"F" INDICATES RED LOCK-ON HASP

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS	
LIGHTING	1,014 VA	125.00%	1,268 VA		
LIGHTING - EXTERIOR	330 VA	125.00%	413 VA	**TOTAL CONN. LOAD:**	3,144 VA
RECEPTACLE	1,800 VA	100.00%	1,800 VA	**TOTAL EST. DEMAND:**	3,480 VA
				TOTAL CONN.:	13 A
				TOTAL EST. DEMAND:	15 A

NOTES:

MARK	REVISION	DATE	BY

Architect: JTL | Checked By: JTL | Scale: As indicated
Technician: TK | Date: 10/10/2024 | T-R-S: 82-7-33

Project No: 124.0187.01

Sheet E101

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MARSHALLTOWN LINN CREEK TRAILHEAD

ELECTRICAL FLOOR PLANS

SNYDER & ASSOCIATES, INC.

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SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet E101

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SERVICE RESPONSIBILITY MATRIX				
NOTES: 1. ITEMS NOT LISTED ARE CONTRACTOR FURNISHED/CONTRACTOR INSTALLED UNLESS OTHERWISE NOTED.				
ABBREVIATIONS: CP/CI : CONTRACTOR PROVIDED / CONTRACTOR INSTALLED. CP/UI : CONTRACTOR PROVIDED / UTILITY INSTALLED. UP/UI : UTILITY PROVIDED / UTILITY INSTALLED. UP/CI : UTILITY PROVIDED / CONTRACTOR INSTALLED.				
LABEL	CP/CI	CP/UI	UP/UI	UP/CI
PRIMARY CONDUIT	●			
PRIMARY CONDUCTORS			●	
XFR PAD	●			
SECONDARY CONDUIT	●			
SECONDARY CONDUCTORS	●			
METER ENCLOSURE	●			
METER				●
CT CABINET	●			
CURRENT TRANSFORMERS			●	
POTENTIAL TRANSFORMERS			●	
CT TERMINATION, XFR to CT			●	
SECONDARY TERMINATIONS			●	
METER-CT CONDUIT	●			

RISER DIAGRAM GENERAL NOTES

A. DIAGRAM INDICATES OVERALL LAYOUT OF ELECTRICAL DISTRIBUTION SYSTEM. REFER TO FLOOR PLANS FOR EQUIPMENT LOCATIONS.

B. USE COPPER CONDUCTORS UNLESS OTHERWISE INDICATED.

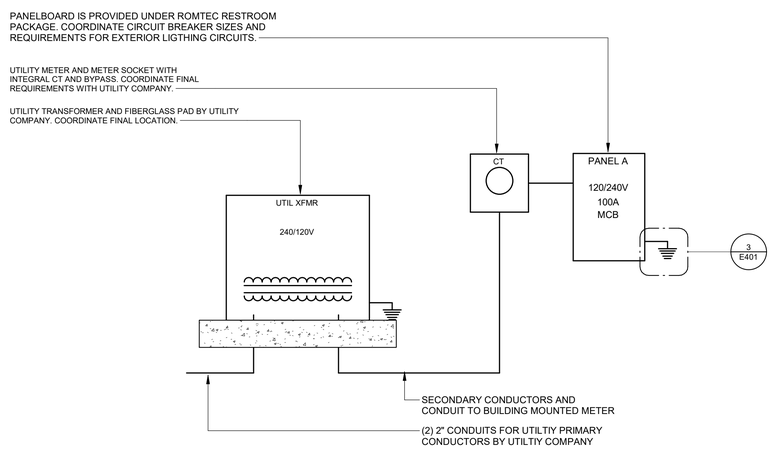
C. MATCH NEUTRAL CONDUCTOR SIZE TO THE PHASE CONDUCTORS UNLESS OTHERWISE NOTED.

D. ALL WIRING SHALL BE IN RACEWAY AS NOTED. REFER TO SPECIFICATIONS FOR CONDUIT APPLICATION REQUIREMENTS.

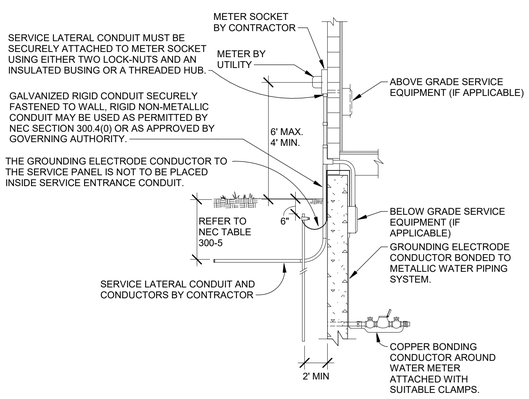
E. INSTALL UTILITY TRANSFORMER PAD, METERING EQUIPMENT, AND SERVICE ENTRANCE FEEDERS IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS.

(#) RISER DIAGRAM KEYED NOTES:

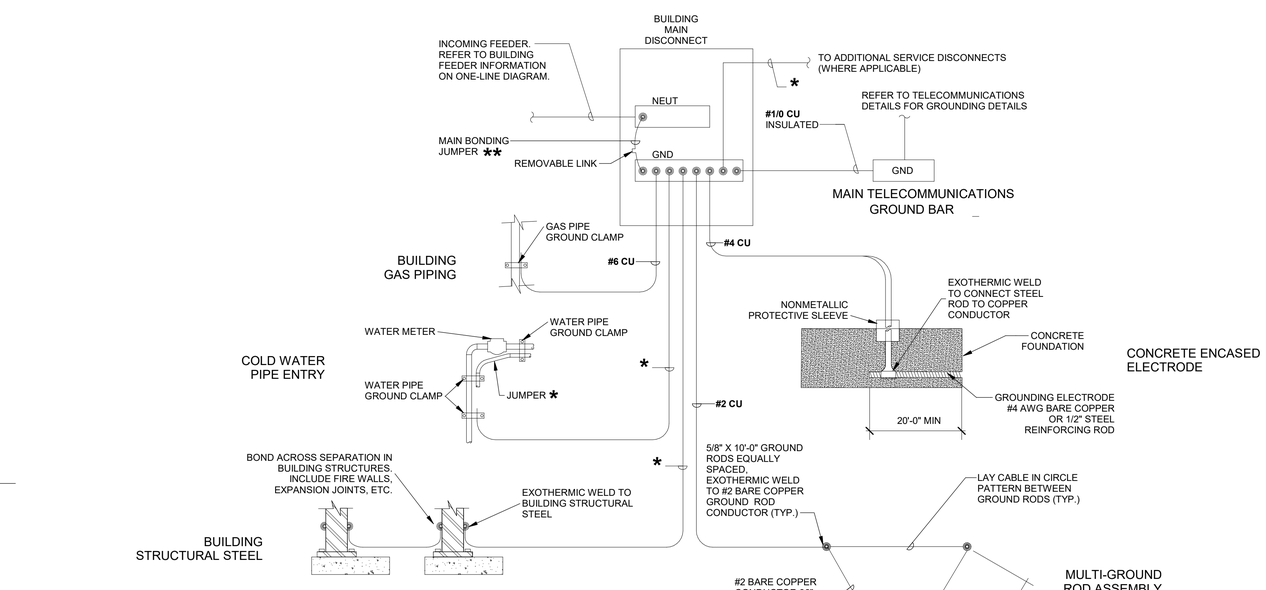
1. NOTE 1.
2. NOTE 2.



1 ONE-LINE DIAGRAM
NOT TO SCALE



2 UNDERGROUND SERVICE ENTRANCE DETAIL
NOT TO SCALE



VERIFY NEC YEAR ADOPTED FOR THE PROJECT LOCATION

* SIZE GROUNDING ELECTRODE CONDUCTOR AND BONDING PER NEC 250.66 AND TABLE BELOW. ALL CONDUCTORS TO BE COPPER.
TABLE BASED ON NEC 2020
TABLE 250.66 GROUDING ELECTRODE CONDUCTOR FOR ALTERNATING-CURRENT SYSTEMS

SIZE OF LARGEST UNGROUDNING CONDUCTOR OR EQUIVALENT AREA FOR PARALLEL CONDUCTORS (AWG/KCMIL)		SIZE OF GROUNDING ELECTRODE CONDUCTOR (AWG/KCMIL)
COPPER	ALUMINUM OR COPPER-CLAD AL	COPPER
#2 OR SMALLER	#1/0 OR SMALLER	#8
#1 OR #1/0	#2/0 OR #3/0	#6
#2/0 OR #3/0	#4/0 OR 250	#4
OVER #3/0 THROUGH 350	OVER 250 THROUGH 500	#2
OVER 350 THROUGH 600	OVER 500 THROUGH 900	#1/0
OVER 600 THROUGH 1100	OVER 900 THROUGH 1750	#2/0
OVER 1100	OVER 1750	#3/0

** SIZE BONDING JUMPER PER NEC 250.102. USE TABLE ABOVE FOR ALL CONDUCTORS BETWEEN #2 AND 1100. ALL INCOMING CONDUCTORS OVER 1100 CU OR 1750 AL SHALL BE SIZED PER THE TABLE 250.102(C). SERVICE EQUIPMENT SHALL BE SUPPLIED WITH BONDING JUMPER FROM THE MANUFACTURER.

NOTES

A. ALL AVAILABLE GROUNDING ELECTRODES WHICH ARE PRESENT AT THE BUILDING OR STRUCTURE SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM (GES). ADDITIONAL CODE-REQUIRED GROUNDING CONNECTIONS NOT SHOWN SHALL BE PROVIDED. CONNECTIONS WHICH ARE ENCASED, UNDERGROUND, OR INACCESSIBLE SHALL BE EXOTHERMIC WELD.

B. ALL BONDING JUMPERS CONNECTING GROUNDING ELECTRODES TO THE GES SHALL BE SIZED EQUAL TO THE GROUNDING ELECTRODE CONDUCTOR (GEC) IN ACCORDANCE WITH NEC 250.53(C). OTHER BONDING JUMPERS SHALL BE SIZED AS OTHERWISE DESCRIBED IN NEC ARTICLE 250. CONDUCTORS SHALL BE BARE COPPER UNLESS OTHERWISE NOTED.

C. REFER TO SPECIFICATIONS FOR ADDITIONAL PRODUCT AND MATERIAL REQUIREMENTS. GROUNDING AND BONDING METHODS AND MATERIALS SHALL COMPLY WITH NEC ARTICLE 250.

D. REFER TO TECHNOLOGY DETAILS FOR ADDITIONAL REQUIREMENTS RELATED TO TELECOM GROUNDING.

3 GROUNDING ELECTRODE SYSTEM
NOT TO SCALE

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Architect: Checker | Checked By: Checker | Scale: As indicated
Technician: Author | Date: 10/10/2024 | T-R-S: 82-7-33

Project No: 124.0187.01

Sheet E401

MARSHALLTOWN LINN CREEK TRAILHEAD

ELECTRICAL ONE-LINE DIAGRAM & DETAILS

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LIGHTING FIXTURE SCHEDULE

NOTES:

1. ALL FIXTURES SHALL BE U.L. OR SIMILARLY LISTED.
2. INCLUDE A MINIMUM 1 YEAR WARRANTY FOR LIGHTING FIXTURES, WHERE NOT OTHERWISE SPECIFIED.
3. REFER TO ARCHITECTURAL DOCUMENTS FOR EXACT MOUNTING LOCATIONS, DETAILS, AND CONFIGURATIONS OF ALL LUMINAIRES. IF ARCHITECTURAL DRAWINGS DO NOT CLARIFY EXACT MOUNTING LOCATION OR DETAIL, ISSUE AN RFI FOR ARCHITECT TO SPECIFICALLY CLARIFY PRIOR TO FIXTURE ROUGH-IN.
4. VERIFY COMPATIBILITY OF LIGHT FIXTURES WITH ARCHITECTUREAL CEILING PLAN, MATERIALS, ADJACENT CONSTRUCTION, AND ADJACENT FINISHES PRIOR TO SHOP DRAWINGS SUBMITTAL. ADJUST FIXTURE TYPE, CONSTRUCTION, FLANGE, AND OTHER COORDINATION DETAILS AS REQUIRED FOR CEILING TYPE. NOTIFY THE ARCHITECT OF ANY CONFLICTS WITH THE PROPOSED INSTALLATION.
5. CONTRACTOR IS RESPONSIBLE FOR ALL MISCELLANEOUS HARDWARE NECESSARY TO INSTALL AND SUPPORT THE LUMINAIRES.
6. AIM AND TARGET ADJUSTABLE INTERIOR AND EXTERIOR LIGHT FIXTURES UNDER THE OBSERVATION AND IN COMPLIANCE WITH RECOMMENDATIONS OF THE ARCHITECT. INCLUDE LABOR AND MATERIAL COSTS MADE NECESSARY BY THIS REQUIREMENT.
7. CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND FILLING OUT ALL UTILITY REBATE FORMS FOR OWNER.

DESIGNED BY: JTL

TYPE	MANUFACTURER	MODEL	DESCRIPTION	FINISH	LUMENS	CRI	DRIVER TYPE	SOURCE-CCT	VOLTAGE	LOAD-VA	APPROVED EQUALS
B1	LIGMAN USA	UJE-10555-15W-M-W40-01-120/277V	BOLLARD LIGHT	BLACK	1600	70	LED 0-10V	LED - 4000K	120 V	15 VA	AS APPROVED BY ENGINEER
F1	LUMINAIRE LED	VPF4-4FT-NODIM-25W-40K-MVOLT-OP-BLK-WL	SURFACE MOUNTED FIXTURE - STRIP 4'	BLACK	2900	80	LED 0-10V	LED - 4000K	120 V	20 VA	AS APPROVED BY ENGINEER
F2	HYDREL	SAF1-LED-P1-RGBW4-MVOLT-TBD-CWL-KM-CJB-DMX-C2-BL	GROUND MOUNTED FLOOD LIGHT, RGBW. 20-DEGREE DISTRIBUTION.	BLACK		-	LED - DMX	RGBW LED	120 V	25 VA	AS APPROVED BY ENGINEER
F3	KENALL	ES3-48-1-45L40K-DCC-1-DV-P5H-PP-IP65	SURFACE MOUNTED FIXTURE - STRIP 4' LENGTH, 3" WIDE, IP65 RATED, POLYCARBONATE LENS	BLACK	4500	80	LED 0-10V	LED - 4000K	120 V	24 VA	AS APPROVED BY ENGINEER
P1	LIGMAN USA	USM-21121-LAT-66W-W40-01-120/277V-RGBW	EXTERIOR SITE LIGHTING COLUMN. LATTICE EXTERIOR FINISH WITH BLACK FINISH. IK08 VANDAL IMPACT RESISTANT. RGBW LIGHT SOURCE.	BLACK	1300	70	LED - DMX	RGBW LED	120 V	66 VA	AS APPROVED BY ENGINEER
P2	LANDSCAPE FORMS	CQ753-01 / CQ701-HE-LO	EXTERIOR SITE LIGHTING POLE AND RING LIGHT. 16'-0" POLE. PROVIDE ADDITIONAL HAND HOLE AT +12'-0" FOR OWNER PROVIDED CAMERA AND MOUNT.	BLACK	2100	70	LED 0-10V	LED - 4000K	120 V	40 VA	AS APPROVED BY ENGINEER
P3	LITHONIA	DSX0-LED-P6-40K-70CRI-T3M-MVOLT-RPA-DBLXD	EXTERIOR PARKING LOT POLE AND LIGHT FIXTURE. TYPE 3M DISTRIBUTION. MINIMUM 16,000 LUMENS AT 4,000K CCT. MOUNT VIA 25'-0" ROUND STRAIGHT STEEL POLE 4" DIAMTER WITH BLACK FINISH. PROVIDE WITH POLE BASE COVER.	BLACK	18000	70	LED 0-10V	LED - 4000K	120 V	100 VA	AS APPROVED BY ENGINEER
P4	LITHONIA	DSX0-LED-P6-40K-70CRI-T4M-MVOLT-RPA-DBLXD	SIMILAR TO P3 BUT TYPE 4M DISTRIBUTION.	BLACK	18000	70	LED 0-10V	LED - 4000K	120 V	100 VA	AS APPROVED BY ENGINEER

LIGHTING CONTROLS SCHEDULE

NOTES:

1. PROVIDE LIGHTING CONTROLS AS A COMPLETE SYSTEM AND INCLUDE MATERIAL AND INSTALLATION FOR ALL POWER PACKS, ACCESSORIES, CONTROLLERS, AND WIRING REQUIRED FOR OPERATION.
2. ALL DEVICES SHALL BE U.L. OR SIMILARLY LISTED.
3. ALL DEVICES PROVIDED WITH MANUFACTURER LIMITED 5 YEAR WARRANTY.
4. PROVIDE LIGHTING CONTROLS WITH MANUFACTURER COMPLIANT POWER PACKS AND LOW VOLTAGE ROOM CONTROLLERS IN QUANTITY REQUIRED TO INSTALL A COMPLETE AND OPERATIONAL SYSTEM. MANUFACTURER OR MANUFACTURERS REP TO PROVIDE DEVICE QUANTITES, LAYOUTS AND TYPICAL WIRING DETAILS DURING SHOP SUBMITTAL PROCESS. PROVIDE DIMMING COMPATIBLE DEVICES WHERE DIMMING CONTROLS ARE SHOWN. COORDINATE DIMMING TYPE WITH LIGHTING FIXTURES SHOWN. REFER TO LUMINAIRE SCHEDULE FOR FIXTURE DIMMING TYPE.
5. WHERE WIRELESS LIGHTING CONTROLS ARE PROVIDED. POWERPACKS SHALL BE PROVIDED AND INSTALLED WITHIN MANUFACTURER RECOMENDED DISTANCES TO ENSURE CONTROLLER OPERATION.
6. INSTALL LOW VOLTAGE POWER PACKS AND ROOM CONTROLLERS ABOVE NEARBY ACCESSIBLE CEILING TILES OR IN MECHANICAL/STORAGE SPACES ADJACENT TO CONTROLLED FIXTURES. DO NOT INSTALL POWERPACKS EXPOSED IN COMMON SPACES OR IN INACCESSIBLE LOCATIONS.
7. PROVIDE FACTORY AUTHORIZED REPRESENTATIVE TO DEMONSTRATE TYPICAL INSTALLATION AND COMMISSIONING OF EQUIPMENT.
8. WHERE APPROVED EQUAL MANUFACTURER PRODUCTS SENSOR COVERAGE OR LOAD RATINGS DIFFER FROM BASIS OF DESIGN, CONTRACTOR AND MANUFACTURER ARE RESPONSIBLE FOR PROVIDING ADDITIONAL DEVICES AS NECCESARY TO PROVIDE A COMPLETE AND OPERABLE SYSTEM.
9. ETD'S AND ALL EMERGENCY LIGHTING CONTROLS COMPONENTS SHALL BE TESTED AND LISTED AS COMPATIBLE BY MANUFACTURER WITH NORMAL LIGHTING CONTROLS IN ALL AREAS.
10. UNLESS INDICATED OTHERWISE, LIGHTING CONTROL SCHEMES/OPERATION SHALL BE AS FOLLOWS:

CORRIDORS, VESTIBULES, COMMON SPACES:	SENSORS PROGRAMMED FOR OCCUPANCY MODE, AUTOMATIC ON/OFF OPERATION, 20 MINUTES MINNIMUM, 30 MINUTES MAXIMUM. DIMMING CONTROL OF FIXTURES WITHIN DAYLIGHT ZONES SHALL BE BY ALWAYS ON DAYLIGHT SENSOR.
ALL OTHER SPACES	SENSORS PROGRAMMED FOR VACANCY MODE, MANUAL ON/AUTOMATIC OFF OPERATION 20 MINUTES MINNIMUM, 30 MINUTES MAXIMUM.DIMMING CONTROL OF FIXTURES WITHIN DAYLIGHT ZONES SHALL BE BY ALWAYS ON DAYLIGHT SENSOR.

DESIGNED BY: TK

TYPE	DESCRIPTION	ELECTRICAL	MOUNTING	SENSOR TYPE	COVERAGE	APPROVED MANUFACTURERS
DMX	PROGRAMMABLE DMX CONTROLLER, 1024 ADDRESS OUTPUTS, CALENDAR EVENT SCHEDULING, MULTIPLE SCENE MEMORY AND PLAYBACK	120V	WALL MOUNT ENCLOSURE, NEMA 1	N/A	N/A	NICOLAUDIE
TS	7-DAY ELECTRONIC ASTRONOMIC TIME SWITCH. WEEKLY PROGRAMMABLE SCHEDULING WITH UP TO 28 ON/OFF EVENTS. AUTOMATIC DAYLIGHT SAVINGS ADJUSTMENT. FOUR INDEPENDANTLY PROGRAMMABLE RELAYS. 120-277 VOLT INPUT OPERATION. NON-VOLATILE EEPROM MEMORY.	120-277V	WALL MOUNT ENCLOSURE, NEMA 1	N/A	N/A	INTERMATIC, TORK, NSI

KCL ENGINEERING
300 4th St
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50265
515-724-7938

MARK	REVISION	DATE	BY

Architect: Checker | Checked By: Checker | Scale:
Technician: Author | Date: 10/10/2024 | T-R-S: 82-7-33

Project No: 124.0187.01 | Sheet E402

MARSHALLTOWN, IOWA

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515-964-2020 | www.snyder-associates.com

MARSHALLTOWN LINN CREEK TRAILHEAD

ELECTRICAL SCHEDULES

SNYDER & ASSOCIATES, INC.
SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet E402

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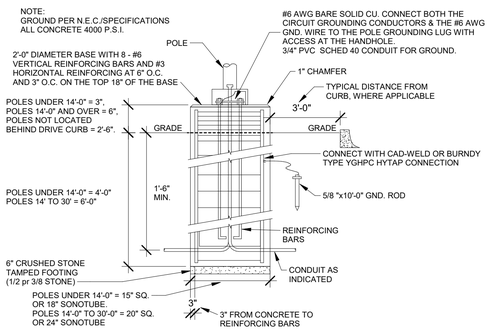
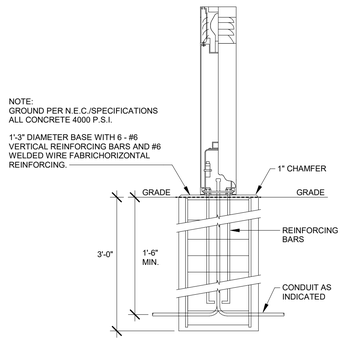
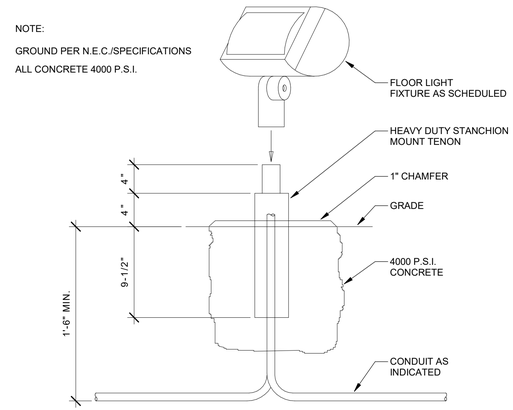


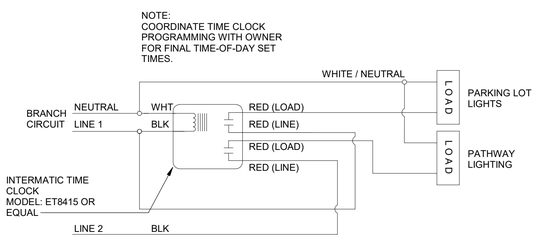
1 LIGHTING POLE BASE - POURED IN PLACE
NOT TO SCALE



2 BOLLARD BASE - POURED IN PLACE
NOT TO SCALE



3 FLOOD LIGHT GROUND MOUNTING DETAIL
NOT TO SCALE



4 TIMECLOCK CONTROL WIRING DETAIL
NOT TO SCALE

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Architect: Checker | Checked By: Checker | Scale: NOT TO SCALE
Technician: Author | Date: 10/10/2024 | T-R-S: 82-7-23

Project No: 124.0187.01

Sheet E501

MARSHALLTOWN LINN CREEK TRAILHEAD

MARSHALLTOWN, IOWA

ELECTRICAL DETAILS

SNYDER & ASSOCIATES, INC.

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CCTV/ACCESS CONTROL NOTES

A. ACCESS CONTROL SYSTEMS ARE PROVIDED AND INSTALLED DIRECTLY BE OWNERS VENDOR INCLUDING ALL COMPONENTS, WIRING, AND PROGRAMMING. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL ROUGH-IN AND CONDUIT TO ABOVE ACCESSIBLE CEILINGS AS REQUIRED.

B. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL DETAILS OF ROUGH-IN REQUIRED WITH ACCESS CONTROL VENDOR PRIOR TO BEGINNING ANY ROUGH-IN.

C. CCTV CAMERA LOCATIONS SHOWN ON DRAWINGS INDICATE ROUGH-IN AND DATA CABLING TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR. CAMERA EQUIPMENT IS PROVIDED AND INSTALLED BY THE OWNER. VERIFY ALL CAMERA LOCATION ROUGH-INS WITH THE OWNER PRIOR TO INSTALLATION AND MODIFY AS REQUIRED.

ABBREVIATIONS - TECHNOLOGY

ADDL	ADDITIONAL
AL	AUDIO LEFT
AR	AUDIO RIGHT
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL, ALARM VALVE
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BAT	BATTERY
BFF	BELOW FINISH FLOOR
BKGD	BELOW / UNDERGROUND
BLDG	BUILDING
BLW	BELOW / UNDERGROUND
BOT	BOTTOM
BTWN	BETWEEN
C	CONDUIT
CCTV	CLOSED CIRCUIT TELEVISION
CD	CONSTRUCTION DOCUMENT
CL	CENTER LINE, CLOSE, CLOSET
CM	CONSTRUCTION MANAGER
CTRL	CONTROL
CTV	CABLE TELEVISION, CONTROL VALVE
(D)	EXISTING TO BE DEMOLISHED
DEF	DEFINITION
DEG	DEGREE
DEMO	DEMOLITION
DESCR	DESCRIPTION
DET	DETAIL
DGTL	DIGITAL
DIAG	DIAGRAM
DWG	DRAWING
E	EXISTING TO REMAIN
ER	EXISTING TO BE RELOCATED
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRIC, ELECTRICAL
EM	EMERGENCY LIGHT FIXTURE
EMER	EMERGENCY
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EXCL	EXCLUDE
FBO	FURNISHED BY OTHERS
FLEX	FLEXIBLE
FR	FLOOR RECEPTACLE, FIRE RATING
FREQ	FREQUENCY
FT	FOOT, FEET
FUT	FUTURE
G	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
GC	GENERAL CONTRACTOR
IRE	INFRARED EMITTER
JB	JUNCTION BOX
KVA	KILO-VOLT-AMPERES
KW	KILOWATTS
LVC	LOW VOLTAGE CONTROL
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUGS ONLY
MAX	MAXIMUM
MLC	MOTOR LOGIC CONTROL
MTD	MOUNTED
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NM	NONMETALLIC
NO	NORMALLY OPEN, NUMBER
NTS	NOT TO SCALE
OAE	OR APPROVED EQUAL
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
PB	PULL BOX, PUSH BUTTON
PNL	PANEL
PWR	POWER
QTY	QUANTITY
R	EXISTING ITEM TO BE REMOVED
RR	EXISTING ITEM TO BE REMOVED AND RELOCATED
RN	EXISTING ITEM TO BE REMOVED AND REPLACED WITH NEW
RCP	REFLECTED CEILING PLAN
REC	RECESSED
RECPT	RECEPTACLE
REQD	REQUIRED
RGS	RIGID GALVANIZED STEEL
RM	ROOM
S	SYNC
SCCR	SHORT CIRCUIT CURRENT RATING
SCHED	SCHEDULE
SECT	SECTION
SPEC	SPECIFICATION
SPKR	SPEAKER
STP	SHIELDED TWISTED PAIR(S)
SYS	SYSTEM
TBD	TO BE DETERMINED
TC	TECHNOLOGY CENTER
TEL	TELEPHONE
TM	TERMINAL BLOCK
TV	TELEVISION
TYP	TYPICAL
UC	UNDERCOUNTER
UL	UNDERWRITERS LABORATORIES
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTIL	UTILITY
V	VIDEO, VOLT, VENT
VCR	VIDEO CASSETTE RECORDER
W	WATT, WIRE, WALL PHONE, WIDTH
WG	WIREGUARD COVER
WP	WEATHERPROOF DEVICE
WR	WEATHER RESISTANT DEVICE, WALL RECEPTACLE
XFER	TRANSFER
XFMR	TRANSFORMER
+24"	INDICATES MOUNTING HEIGHT CENTER LINE OF DEVICE TO FINISHED FLOOR

VIDEO SURVEILLANCE SYMBOLS

	CCTV SECURITY CAMERA, WALL/POLE MOUNTED
	CCTV SECURITY CAMERA, CEILING MOUNTED - REFER TO CAMERA SCHEDULE
NVR	NETWORK VIDEO RECORDER

TELECOMMUNICATION RESPONSIBILITY MATRIX

PROVISION RESPONSIBILITIES DEFINED	OFOI	OFCI	CFCI
COMMUNICATIONS - TELECOM SYSTEMS:			
ROUGH-IN, PATHWAYS AND SLEEVES			
RACKS, FRAMES AND ENCLOSURES			
CABLE MANAGEMENT			
UNINTERRUPTIBLE POWER SUPPLIES (RACK MOUNT)			
PLYWOOD BACKBOARDS			
COPPER BACKBONE CABLING			
OPTICAL FIBER BACKBONE CABLING			
COAXIAL BACKBONE CABLING			
COPPER HORIZONTAL CABLING			
OPTICAL FIBER HORIZONTAL CABLING			
COAXIAL BACKBONE CABLING			
DATA COMMUNICATIONS SWITCHES AND HUBS			
DATA COMMUNICATIONS WIRELESS ACCESS POINTS			
VOICE COMMUNICATIONS SWITCHING AND ROUTING EQUIPMENT			

● OFOI OWNER FURNISHED & OWNER INSTALLED

● OFCI OWNER FURNISHED & CONTRACTOR INSTALLED

● CFCI CONTRACTOR FURNISHED & CONTRACTOR INSTALLED

GENERAL NOTE:

A. MATRIX IS NOT INTENDED TO BE EXHAUSTIVE TO COVER ALL MATERIALS NECESSARY FOR SCOPE AND SHOULD ONLY BE USED TO QUICKLY IDENTIFY SYSTEMS AND RELATED INFRASTRUCTURE INSIDE AND OUTSIDE THE BID OF THIS PROJECT. ANY ITEMS FURNISHED OR INSTALLED BY THE BIDDING CONTRACTOR SHALL COVER ALL REQUIRED APPERTUNANCES NECESSARY FOR A COMPLETE SYSTEM. THIS SHALL INCLUDE BUT NOT BE LIMITED TO, EQUIPMENT, ACCESSORIES, TERMINATIONS, TERMINATION COMPONENTS, ALL FINAL CORDAGE CONNECTIVITY, SOFTWARE, PROGRAMMING, AND THE LABOR TO INSTALL.

TELECOMMUNICATIONS DRAWING LIST

NO.	TITLE
TT000	TELECOM GENERAL NOTES & SYMBOLS
TT101	TELECOM SITE PLAN
TT300	TELECOM DETAILS

KCL ENGINEERING
300 4th St
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515-724-7938

MARK	REVISION	DATE	BY

Architect: Checker | Checked By: Checker | Scale: As indicated

Technician: Author | Date: 10/10/2024 | T-R-S: 82-7-33

Project No: 124.0187.01 | Sheet TT000

MARSHALLTOWN, IOWA

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MARSHALLTOWN LINN CREEK TRAILHEAD

TELECOM GENERAL NOTES & SYMBOLS

SNYDER & ASSOCIATES, INC.

SNYDER & ASSOCIATES

Project No: 124.0187.01

Sheet TT000

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GENERAL NOTES

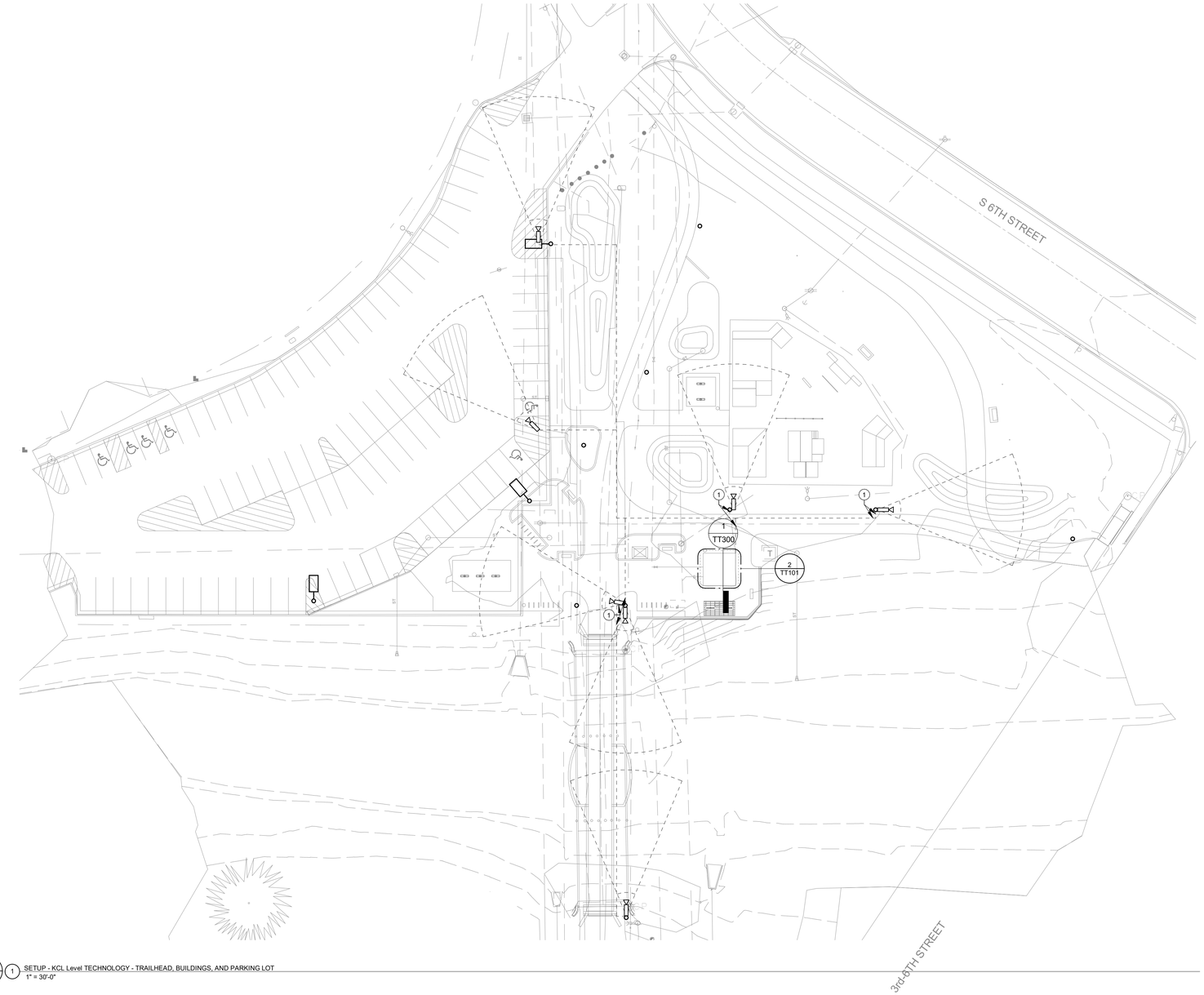
A. COORDINATE LOCATION/INSTALLATION OF WORK WITH ALL OTHER TRADES. NO ASPECT OF A SYSTEM INSTALLATION OR ITS ROUGH-IN SHALL COMMENCE UNTIL PROPER AND TIMELY COORDINATION WITH ALL TRADES ASSOCIATED WITH THE INSTALLATION HAS TRANSPIRED. ITEMS TO BE COORDINATED SHALL INCLUDE BUT NOT BE LIMITED TO: BUILDING STRUCTURE, SHEET METAL, PIPING SYSTEMS, LIGHT FIXTURES, CONDUITS, CABLE TRAYS, ETC. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.

B. PROVIDE PENETRATIONS REQUIRED FOR ROUTING CABLING AND RACEWAYS THROUGH THE BUILDING. COORDINATE FIRE RATED WALL PENETRATIONS AND PROVIDE CONDUIT SLEEVES AND FIRE STOPPING TO MAINTAIN RATING.

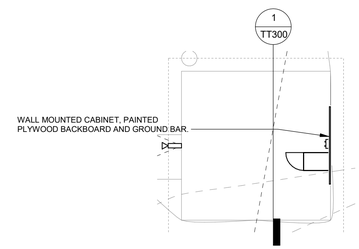
C. PROVIDE J-HOOKS, BRIDLE RINGS AND OTHER ACCESSORIES REQUIRED TO SUPPORT ALL TELECOMMUNICATIONS AND SECURITY MANAGEMENT SYSTEM CABLING.

KEYNOTES (#)

1 DASHED LINE INDICATES CONDUIT FOR CAMERA LOCATIONS, ALL LOCAIONS TO HAVE INDIVIDUAL 1-1/2 INCH CONDUIT RUN TO MDF FOR CAMERA CAT6A CABLE, COORDINATE WITH ELECTRICAL CONTRACTOR AND FIBER OPTIC UTILITIES FOR EXACT PLACEMENT



1 SETUP - KCL Level TECHNOLOGY - TRAILHEAD, BUILDINGS, AND PARKING LOT
1" = 30'-0"



2 ROMTEC RESTROOM BUILDING - MDF LOCATION
1/8" = 1'-0"

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Architect: Checker | Checked By: Checker | Scale: As indicated
Technician: Author | Date: 10/10/2024 | T-R-S: 82-7-33
Project No: 124.0187.01 | Sheet TT101

MARSHALLTOWN LINN CREEK TRAILHEAD

TELECOM SITE PLAN

SNYDER & ASSOCIATES, INC.
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Sheet TT101

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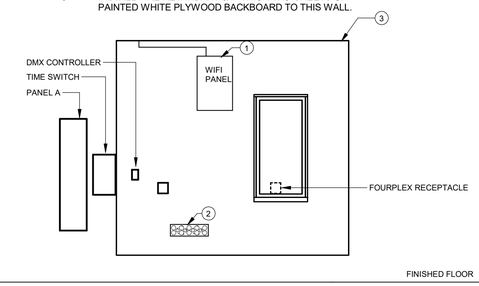
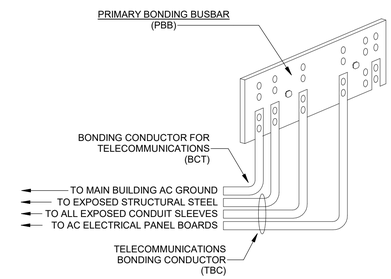
KEYNOTES (#)

1. WIFI AND TECHNOLOGY EQUIPMENT, INCLUDING RACK, WILL BE OFCI
2. ALL TECHNOLOGY EQUIPMENT WILL GROUND TO TMGB
3. INSTALL FIRE RETARDANT 3/4" THICK 4'X8' SHEETS OF PAINTED WHITE PLYWOOD BACKBOARD TO THIS WALL.



1 SECTION VIEW - MDF WALL
3/8" = 1'-0"



NOTES:

A. THIS DETAIL IS INTENDED TO SHOW CONNECTIVITY REQUIREMENTS FOR THE COMMUNICATIONS GROUNDING AND BONDING SYSTEM. SIZE ALL CONDUCTORS IN COORDINATION WITH THE NEC AS WELL AS THE TIA-607-C RECOMMENDATIONS. SEE SPECIFICATION SECTION 27 0526 FOR ADDITIONAL INFORMATION AND CONNECTIVITY REQUIREMENTS.

B. SIZE EACH TELECOMMUNICATIONS GROUND BAR APPROPRIATELY TO HOST ALL REQUIRED CONNECTIONS.

C. ALL CONNECTIONS TO AND WITHIN THE AC GROUNDING ELECTRODE SYSTEM SHALL BE MADE UTILIZING EXOTHERMIC WELDING. ALL OTHER CONNECTIONS SHALL BE DONE UTILIZING IRREVERSIBLE COMPRESSION-TYPE CONNECTIONS.

TELECOM GROUNDING AND BONDING

2 GROUNDING & BONDING - TELECOM ROOM
NOT TO SCALE

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50265
515-724-7938

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Architect: Checker | Checked By: Checker | Scale: As indicated
Technician: Author | Date: 10/10/2024 | T-R-S: 82-7-33

Project No: 124.0187.01 | Sheet TT300

MARSHALLTOWN LINN CREEK TRAILHEAD

MARSHALLTOWN, IOWA

TELECOM DETAILS

SNYDER & ASSOCIATES, INC.
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515-964-2020 | www.snyder-associates.com

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Project No: 124.0187.01
Sheet TT300

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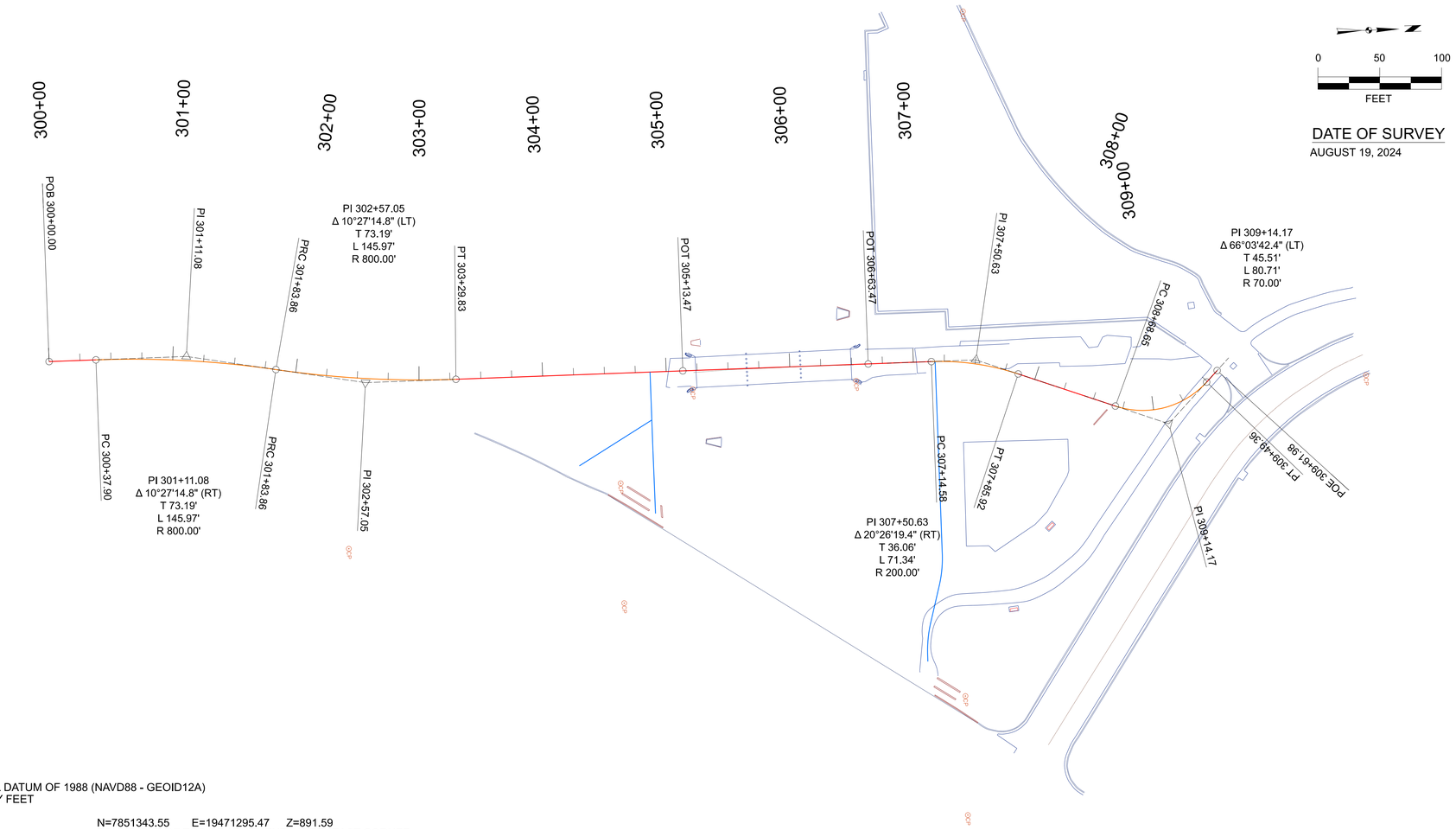

DATE OF SURVEY
AUGUST 19, 2024

BENCHMARKS

NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88 - GEOID12A)
IARTN DERIVED - US SURVEY FEET

BM500	N=7851343.55	E=19471295.47	Z=891.59

FOUND CUT "X" TOP OF ABUTMENT, NORTHEAST CORNER PEDESTRIAN BRIDGE, WEST OF 3RD/6TH STREET BRIDGE.

CONTROL POINTS

IOWA REGIONAL COORDINATE SYSTEM ZONE 9
NAD83(2011)(EPOCH 2010.00) IARTN DERIVED - US SURVEY FEET

CP1	N=3477282.69	E=4882223.93	Z=903.96

FOUND CUT "X" NORTHWEST CORNER SIDEWALK LANDING OF BRIDGE ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP2	N=7851420.80	E=19471649.64	Z=892.22

FOUND CUT "X" NORTHEAST CORNER SIDEWALK LANDING OF BRIDGE ON ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP3	N=7851149.46	E=19471468.08	Z=892.77

FOUND CUT "X" SOUTHEAST CORNER SIDEWALK LANDING OF BRIDGE ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP4	N=7851150.22	E=19471371.19	Z=893.07

FOUND CUT "X" SOUTHWEST CORNER SIDEWALK LANDING OF BRIDGE ON 3RD-6TH STREET. (AS SHOWN ON SURVEY)

CP5	N=7851211.24	E=19471297.39	Z=891.56

FOUND CUT "X" TOP OF ABUTMENT ON SOUTHEAST CORNER PEDESTRIAN BRIDGE WEST OF 3RD STREET - 6TH STREET. (AS SHOWN ON SURVEY)

CP6	N=7851343.56	E=19471295.48	Z=891.59

FOUND CUT "X" TOP OF ABUTMENT ON NORTHEAST CORNER PEDESTRIAN BRIDGE WEST OF 3RD STREET - 6TH STREET. (AS SHOWN ON SURVEY)

CP100	N=7851755.81	E=19471306.28	Z=887.42

SET CUT "X" TOP OF CURB, EAST SIDE S. 6TH STREET, ±P75' WEST OF BRICK BRIDGE, ±P5' WEST OF MARSHALLTOWN SIGN. (AS SHOWN ON SURVEY)

CP101	N=7851440.96	E=19471000.33	Z=889.03

SET CUT "X" TOP OF CURB, NORTH SIDE PARKING LOT, ±P60' WEST OF FIELD SPLIT. (AS SHOWN ON SURVEY)

CP102	N=7850928.58	E=19471415.87	Z=885.44

FOUND MAG NAIL, NORTHWEST CORNER STORM STRUCTURE, NORTH SIDE W. HIGH STREET, ±P12' SOUTHWEST OF HYDRANT. (AS SHOWN ON SURVEY)

MARSHALLTOWN TRAIL

STATION NORTHING EASTING

Element: Linear
START (START) 30000.000 7850691.973 19471255.660
PC (PC) 30037.898 7850729.871 19471255.660
Tangential Direction: N0.000°W
Tangential Length: 37.898

Element: Circular
PC (PC) 30037.898 7850729.871 19471255.660
HPI (HPI) 30111.085 7850803.057 19471255.660
CC (CC) 7850729.871 19472055.660
PRC (PRC) 30183.865 7850875.029 19471268.939
Radius: 800.000
Delta: 10.454° Right
Degree of Curvature (Arc): 7.162°
Length: 145.967

Tangent: 73.187
Chord: 145.765
Middle Ordinate: 3.327
External: 3.341
Back Tangent Direction: N0.000°W
Back Radial Direction: N90.000°E
Chord Direction: N5.227°E
Ahead Radial Direction: S79.546°E
Ahead Tangent Direction: N10.454°E

Element: Circular
PRC (PRC) 30183.865 7850875.029 19471268.939
HPI (HPI) 30257.051 7850947.001 19471282.219
CC (CC) 7851020.187 19470482.219
PT (PT) 30329.832 7851020.187 19471282.219
Radius: 800.000
Delta: 10.454° Left
Degree of Curvature (Arc): 7.162°
Length: 145.967

Tangent: 73.187
Chord: 145.765
Middle Ordinate: 3.327
External: 3.341
Back Tangent Direction: N10.454°E
Back Radial Direction: S79.546°E
Chord Direction: N5.227°E
Ahead Radial Direction: S90.000°E
Ahead Tangent Direction: N0.000°E

STATION NORTHING EASTING

Element: Linear
PT (PT) 30329.832 7851020.187 19471282.219
HPI (HPI) 30513.474 7851203.830 19471282.219
Tangential Direction: N0.000°E
Tangential Length: 183.642

Element: Linear
HPI (HPI) 30513.474 7851203.830 19471282.219
HPI (HPI) 30663.474 7851353.830 19471282.219
Tangential Direction: N0.000°W
Tangential Length: 150.000

Element: Linear
HPI (HPI) 30663.474 7851353.830 19471282.219
PC (PC) 30714.577 7851404.933 19471282.219
Tangential Direction: N0.000°W
Tangential Length: 51.103

Element: Circular
PC (PC) 30714.577 7851404.933 19471282.219
HPI (HPI) 30750.632 7851440.988 19471282.219
CC (CC) 7851404.933 19471482.219
PT (PT) 30785.921 7851474.774 19471294.810
Radius: 200.000
Delta: 20.439° Right
Degree of Curvature (Arc): 28.648°
Length: 71.345

Tangent: 36.055
Chord: 70.967
Middle Ordinate: 3.173
External: 3.224
Back Tangent Direction: N0.000°E
Back Radial Direction: S90.000°E
Chord Direction: N10.219°E
Ahead Radial Direction: S69.561°E
Ahead Tangent Direction: N20.439°E

STATION NORTHING EASTING

Element: Linear
PT (PT) 30785.921 7851474.774 19471294.810
PC (PC) 30868.655 7851552.299 19471323.701
Tangential Direction: N20.439°E
Tangential Length: 82.733

Element: Circular
PC (PC) 30868.655 7851552.299 19471323.701
HPI (HPI) 30914.167 7851594.946 19471339.594
CC (CC) 7851576.743 19471258.107
PT (PT) 30949.364 7851626.776 19471307.064
Radius: 70.000
Delta: 66.062° Left
Degree of Curvature (Arc): 81.851°
Length: 80.710

Tangent: 45.512
Chord: 76.313
Middle Ordinate: 11.314
External: 13.495
Back Tangent Direction: N20.439°E
Back Radial Direction: S69.561°E
Chord Direction: N12.592°W
Ahead Radial Direction: N44.377°E
Ahead Tangent Direction: N45.623°W

Element: Linear
PT (PT) 30949.364 7851626.776 19471307.064
END (END) 30961.984 7851635.601 19471298.044
Tangential Direction: N45.623°W
Tangential Length: 12.619

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= 50'
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:

Project No: 124.0187.01 | Sheet G001

LINN CREEK TRAILHEAD

SURVEY CONTROL AND REFERENCE INFORMATION

MARSHALTOWN, IOWA

SNYDER & ASSOCIATES, INC.
2727 SW SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | WWW.SNYDER-ASSOCIATES.COM

SNYDER & ASSOCIATES

Project No: 124.0187.01
Sheet G001

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ESTIMATED BRIDGE QUANTITIES (144'-6 x 12'-0)

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QTY.
1	2402-2720000	EXCAVATION, CLASS 20	CY	58	
2	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	40	
3	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	5490	
4	2429-0000100	PRE-ENGINEERED STEEL TRUSS TRAIL BRIDGE, 144'-6 X 12'-0	EACH	1	
5	2501-0201057	PILES, STEEL, HP10 X 57	LF	480	
6	2526-8285000	CONSTRUCTION SURVEY	LS	1	
7	2533-4980005	MOBILIZATION	LS	1	
8	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1	

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE
SOUTH ABUTMENT	18.7
NORTH ABUTMENT	18.7
TOTAL (CU. YDS.)	37.4

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION
SOUTH ABUTMENT	29
NORTH ABUTMENT	29
TOTAL (CU. YDS.)	58

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2402-2720000	EXCAVATION, CLASS 20 QUANTITIES ASSUME THAT THE CHANNEL GRADING AND APPROACH TRAIL GRADING ARE COMPLETE. SUITABLE CLASS 20 EXCAVATION MATERIAL MAY BE WASTED ON THE TRAILHEAD SITE, AS DIRECTED BY THE ENGINEER. SUITABLE EXCAVATION MATERIAL SHALL BE AS DESIGNATED IN IOWA DOT STANDARD SPECIFICATIONS SECTION 2102.02, D, 2&3.
2	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) THIS BID ITEM INCLUDES THE CONCRETE FOR THE BRIDGE ABUTMENTS, MASKWALLS, PAVING NOTCHES, AND WINGS. THIS BID ITEM INCLUDES ALL COSTS ASSOCIATED WITH FURNISHING ITEMS AND COMPLETING THE WORK AND INSTALLATION ASSOCIATED WITH SUBDRAINS AND ABUTMENT BACKFILL AS NOTED ON SHEETS V.8 AND V.9. INCLUDES ALL RESILIENT JOINT FILLER REQUIRED. INCLUDES FURNISHING AND PLACING CONCRETE SEALER ON ABUTMENT SEATS AS NOTED IN THESE PLANS. PAYMENT SHALL BE MADE BASED ON PLAN QUANTITIES. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ADJUSTMENTS TO THE ABUTMENT DETAILS AS NOTED IN THESE PLANS. CONTRACTOR SHALL PROVIDE CERTIFIED PLANT INSPECTION IN ACCORDANCE WITH IOWA DOT STANDARD SPECIFICATIONS SECTION 2521.
3	2404-7775005	REINFORCING STEEL, EPOXY COATED THIS BID ITEM INCLUDES THE REINFORCING STEEL FOR THE BRIDGE ABUTMENTS, MASKWALLS, PAVING NOTCHES, AND WINGS. PAYMENT SHALL BE MADE BASED ON PLAN QUANTITIES. NO ADDITIONAL PAYMENT SHALL BE MADE FOR ADJUSTMENTS TO THE ABUTMENT DETAILS AS NOTED IN THESE PLANS.
4	2429-0000100	PRE-ENGINEERED STEEL TRUSS TRAIL BRIDGE, 144'-6 X 12'-0 BRIDGE SHALL BE A CONTECH (OR APPROVED EQUAL) CUSTOM KEYSTONE PRE-ENGINEERED TRUSS WITH OVERLOOKS. STEEL FINISH SHALL BE WEATHERING STEEL. ALL BRIDGE DETAILS, MATERIALS, AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH IOWA DOT STANDARD SPECIFICATIONS SECTION 2429 UNLESS OTHERWISE NOTED IN THE GENERAL NOTES INCLUDED IN THESE PLANS. THE BRIDGE SHALL INCLUDE SAFETY RAILS MODIFIED TO INCORPORATE ARTISTIC PANELS TO BE FABRICATED AND INSTALLED BY OTHERS. INCLUDES ALL COSTS ASSOCIATED WITH DESIGNING, FABRICATING AND INSTALLING THE ORNAMENTAL APPROACH SAFETY RAILS AS DETAILED AND NOTED IN THESE PLANS. INCLUDES ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE COVER PLATES AS DETAILED ON SHEET V.X. ALL MATERIALS AND CONSTRUCTION FOR ALL CONCRETE AND REINFORCING STEEL FOR THE BRIDGE DECK ITEMS INCUDES A POURED CONCRETE DECK, SHALL BE IN ACCORDANCE WITH IOWA DOT STANDARD SPECIFICATIONS SECTION 2403 AND 2404, RESPECTIVELY. CONTRACTOR SHALL PROVIDE CERTIFIED PLANT INSPECTION FOR ALL CONCRETE IN ACCORDANCE WITH IOWA DOT STANDARD SPECIFICATIONS SECTION 2521. THE SANDBLAST SURFACES FOR THE WEATHERING STEEL SHALL INCLUDE AREAS VISIBLE FROM THE OUTSIDE LOOKING IN AND AREAS LOOKING OUT FROM THE TRAIL.
5	2501-0201057	PILES, STEEL, HP10 X 57 - -
6	2526-8285000	CONSTRUCTION SURVEY - -
7	2533-4980005	MOBILIZATION
8	2401-6745625	REMOVAL OF EXISTING BRIDGE - -

SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
SOUTH ABUTMENT	--	--	2745
NORTH ABUTMENT	--	--	2745
TOTAL (LBS.)			5490

SUMMARY OF FOUNDATIONS

LOCATION	STRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
SOUTH ABUTMENT	STUB ABUTMENT	HP 10X57	4	60	240
NORTH ABUTMENT	STUB ABUTMENT	HP 10X57	4	60	240

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
Steven M. Kunz
14321
IOWA

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 — Date: XX-XX-2025

Steven M. Kunz
Printed or Typed Name

My license renewal date is December 31, 2025

Pages or sheets covered by this seal: SHEETS V.1 THRU V.10
(EXCLUDING HYDRAULIC DATA, CHANNEL GRADING, AND REVETMENT)

TRAIL QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW

144'-6 TRUSS SPAN 12'-0 TRAIL
PRE-ENGINEERED STEEL TRUSS
RECREATIONAL TRAIL BRIDGE

ESTIMATE BRIDGE QUANTITIES

STA. XXX+XX.XX — OCTOBER, 2024

MARSHALL COUNTY

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:
Project No: 124.0187.01 | Sheet V001

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

ESTIMATED BRIDGE QUANTITIES

SNYDER & ASSOCIATES, INC.
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ANKENY, IOWA 50023
515-964-2020 | WWW.SNYDER-ASSOCIATES.COM

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Project No: 124.0187.01
Sheet V001

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Specifications:

Design:

AASHTO LRFD 8th Ed, Series of 2017, except as noted in the current Iowa Bridge Design Manual.

Construction:

Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2023, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions shall apply to construction work on this project.

Design Stresses:

Design stresses for the following materials are in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Ed, Series of 2017, except as noted in the current Iowa Bridge Design Manual.

Reinforcing steel in accordance with AASHTO LRFD Section 5, Grade 60 for epoxy coated and non-coated, and Grade 60 or 75 for stainless.

Concrete in accordance with AASHTO LRFD Section 5, f'c = 4.0 ksi
Bridge Deck Concrete f'c = 4.0 ksi.

Structural steel in accordance with AASHTO LRFD Section 6. ASTM A709 Grade 36, Grade 50, and Grade 50W (AASHTO M270 Grade 36, Grade 50, and Grade 50W).

General Notes:

The intent of this design is to construct a 144'-7 3/4" x 12'-0" pre-engineered steel truss trail bridge over Linn Creek in Marshall County, Iowa.

This bridge is designed for pedestrian loading of 90 pounds per square foot applied to the complete width of the deck area shown in these plans and an H10 design vehicle. Design vehicle load is not placed in combination with pedestrian load.

All dimensions and details shown on these plans pertinent to new construction shall be verified in the field by the Contractor before starting construction.

The City and utility companies whose facilities are shown on the plans or known to be within the construction limits shall be notified by the Bridge Contractor of the construction starting date.

It shall be the Bridge Contractor's responsibility to provide sites for excess excavated material. No payment for overhaul will be allowed for material hauled to these sites.

Class 20 excavation quantity is based on the assumption that the existing ground line as shown on the "Situation Plan" has remained undistrubed prior to starting construction of the abutment.

Welding of anchor bolts shall not be allowed. The Contractor shall obtain a template from the manufacturer / fabricator for proper placement of the anchor bolts.

Welding of nuts or other hardware to truss members, splice plates, base plates, or any type of connection plates, for any connections or for connections / splices of truss members, is prohibited.

During construction of this project, the Bridge Contractor will be required to coordinate operations with those of other Contractors working within the same area.

Pollution Prevention Plan is included in the trail plans.

Concrete and Reinforcing Steel Notes:

All reinforcing steel shall be securely wire in place before concrete is placed. Bar chairs spaced at not more that 3'-0" centers in either direction shall be used to support all reinforcing in accordance with the standard specifications.

Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.

All exposed corners 90 degrees or sharper are to be filleted with a ¾" dressed and beveled strip.

Keyway dimensions shown on the plans are based on nominal dimensions unless stated otherwise. In addition, the bevel used on the keyway shall be limited to a maximum of 10 degrees from vertical.

Construction joint keyways are to be formed with beveled 2x8's, except as noted.

All reinforcing bars and bars noted as dowels supplied for this structure shall be deformed reinforcement unless otherwise noted or shown.

Concrete sealer is to be applied to the exposed bridge seat surface at the abutments according to section 2403 of the Standard Specifications of the Iowa Department of Transportation.

These bridge plans label all reinforcing steel with english notation (5a1 is ⅝ inch diameter bar). English reinforcing steel received in the field may display the following "Bar Designation". The "Bar Designation" is the stamped impression on the reinforcing bars, and is equivalent to the bar diameter in millimeters.

English Size	3	4	5	6	7	8	9	10	11
Bar Designation	10	13	16	19	22	25	29	32	36

Abutment details shown in these plans have been established for a 3'-6" height from the abutment bearing seat to top of deck at the centerline trail and profile grade line. For other heights, the Contractor may modify dimensions shown in these plans. The Contractor shall submit details of all modifications to the Engineer for approval before fabrication. All proposed changes must maintain the specified profile grade, camber, and vertical clearance. Any changes in plan quantities due to the change of dimensions from those shown in these plans will not be measured for payment, and no adjustments to payment will be made.

Working Drawing and Calculation Submittals

Working drawings and calculations shall be submitted for the following items shown in the table below. (Note additional working drawings and calculations may be required in accordance with Article 1105.03 of the Standard Specifications.)

Submittal requirements for working drawings and calculations shall be in accordance with 1105.03 of the Standard Specifications for Highway and Bridge Construction of the Iowa Department of Transportation. The absence of a certification requirement for a submittal does not relieve the Contractor of the responsibility to attain certification.

Calculation submittals in this table which are associated with working drawing submittals shall be submitted on the same day. Review time for calculation submittals shall be of the same duration as and run concurrently with review time for associated working drawings. The calculation submittals listed in the table are not meant to be an exhaustive list and do not relieve the Contractor from providing additional calculation submittals if requested by the Engineer.

No.	Working Drawing Description		Certified by Iowa P.E. (Yes/No)
1	Pre-Engineered Steel Truss Bridge		Yes
2	Ornamental Approach Fence		Yes
3	Deck Joint Cover Plate Assemblies		No
4			
No.	Calculation Description		Certified by Iowa P.E. (Yes/No)
5	Pre-Engineered Steel Truss Bridge		Yes
6	Ornamental Approach Fence		Yes
7			

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:
Project No: 124.0187.01 | Sheet V002

MARSHALLTOWN, IOWA

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LINN CREEK TRAILHEAD

GENERAL NOTES

SNYDER & ASSOCIATES, INC.

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Project No: 124.0187.01
Sheet V002

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Pre-Engineered Steel Truss Notes:

The bridge shall be a 144’-7 3/4” truss span x 12’-0” trail pre-engineered steel truss. The bridge shall have a 12’-0” wide clear distance between rails.

The truss type shall be a Contech (or approved equal) custom Keystone pre-engineered truss with overlooks.
The pre-engineered steel truss shall be fabricated using weathering steel in accordance with Section 2429.02, B, 2, of the Standard Specifications of the Iowa Department of Transportation. Alternate allowable material specifications for members are shown below:
HSS Sections: ASTM A847 weathering steel.
Shapes and Plates: ASTM A588 weathering steel.

Welding procedures that are not shown in Section 2429 of the Standard Specifications shall be submitted for approval to the Iowa DOT Construction and Materials Bureau.

Floor beam spacing shall be 14’-0” on center or less.

All members shall be center-aligned where different sizes are connected. All open ends of HSS tubes shall be sealed with 1/4-inch minimum cap plates, welded in place with a continuous groove weld. Provide end plate corner clips and additional drain holes to prevent water accumulation in the truss members.

For aesthetic purposes, it is intended that truss splices shall be as unobtrusive as possible. This shall be accomplished with the following requirements for field splices. Alternate details may be proposed for review and approval by the Engineer. Splices shall be made using longitudinal splice plates, with splice plates located inside the truss members for HSS shapes and on the inside face for I-shaped members; only bolt heads and washers shall be visible from outside the truss members.

Safety railings and rub rails shall be parallel to the profile grade elevation, with the top railings at the height above bridge deck as shown in these plans. Railings shall be constructed of 2x2 square vinyl coated wire mesh supported by 2x2 tube steel at the top and bottom and a 2x8 tube steel rub rail at 44 inches above the bridge deck as shown on Design Sheet V004. Railings shall meet the requirements of Section 2429 of the Standard Specifications of the Iowa Department of Transportation.

The bridge railing shall extend beyond the end of truss span as required to meet the approach fence as detailed in these plans. The top of the bridge rail shall match the top of the approach fence. The top of the bridge rub rail shall match the top of the rub rail on the approach fence. The maximum opening between the bridge rail and the approach fence shall be as noted on Design Sheet V008.

All loads shall be in accordance with Standard Specifications 2429.02, A, 2, unless noted or detailed otherwise. Live loads are indicated on Design Sheet V001. Fracture critical requirements for this bridge are not waived.

Maximum allowable deflection due to live load as described in the contract documents shall not exceed L/500 where L is the length of the truss from center to center of bearing in the longitudinal direction.

The horizontal deflection due to lateral wind load shall not exceed 1/500 of the length of the span.

Bridge camber requirements shall be a in accordance with Section 2429 of the Standard Specifications.

Truss bearing design values used for abutment and pier design (per base plate) are shown below. Deviations from these design values shall be reported to the Engineer for approval prior to fabricating the bridge. A negative vertical reaction indicates uplift.

Load	145'-0" Truss Span
Dead Load (Vert.)	53.0 kips
Live Load (Vert.)	41.3 kips
Thermal (Longit.)	8.0 kips
Wind (Vert.)	±12.5 kips
Wind (Horiz.)	13.1 kips
Wind - Windward (Vert.)	-16.4 kips
Wind - Leeward (Vert.)	-5.5 kips

Details in these plans, at both abutments, are based on an anticipated maximum thermal movement for the full length of bridge of 1½" (¾" each way from 50°F). The thermal movement design value shall be determined by the truss manufacturer and shall be based on a service temperature range of -25°F to 125°F. The truss and bearing details shall accommodate the thermal movement design values and shall accommodate adjustments necessary for the ambient temperature at the time of construction. The truss manufacturer shall include the thermal movement design values for each truss bearing with the shop drawing submittal and include anchor bolt and bearing setting instructions for ambient temperatures ranging from 10°F through 100°F, at 10° increments.

Truss bearings shall be fixed or expansion as detailed on the Longitudinal Section Along ℄ Trail on Design Sheet V004. E = Expansion Bearing; F = Fixed Bearing.

See additional notes in these plans for shifting the abutment backwall location if necessary to accommodate the design thermal movements.

The truss manufacturer shall design the anchor bolts including embedment depth in the abutment footing or pier cap. Certain dimensions as shown in these plans may require adjustment to match the dimensions of the actual truss provided. All adjusted dimensions, anchor bolt requirements, and anchor bolt loads shall be submitted to the Engineer for review prior to construction. Changes from those dimensions shown in these plans shall be indicated in the submittal to the Engineer. The truss bearing plate shall be sized so that the appropriate allowable service limit and/or strength limit state bearing stresses on the abutment are not exceeded.

Pre-Engineered Steel Truss Deck Notes:

The deck shall consist of reinforced concrete and be designed by the prefabricated truss manufacturer to meet all applicable requirements of AASHTO LRFD 8th Edition, Series of 2017, the project specifications and the Standard Specifications of the Iowa Department of Transportation. All reinforcing bars in the deck shall be epoxy coated.

The concrete deck surface finish shall be in accordance with the Iowa DOT Standard Specifications Section 2412.03, D, 5.

The concrete deck shall be crowned at the center with cross slopes of 1.5%.
Transition bridge approach pavement to match the typical trail cross section.

Deck joint cover plates shall be furnished and installed as detailed on Design Sheet V006.

Deicing salts and other corrosion inducing compounds shall not be applied to this bridge deck or approaches.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:
Project No: 124.0187.01 | Sheet V003

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

GENERAL NOTES

SNYDER & ASSOCIATES, INC.
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Project No: 124.0187.01
Sheet V003

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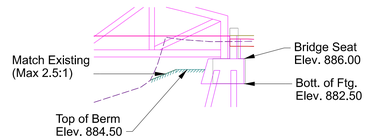
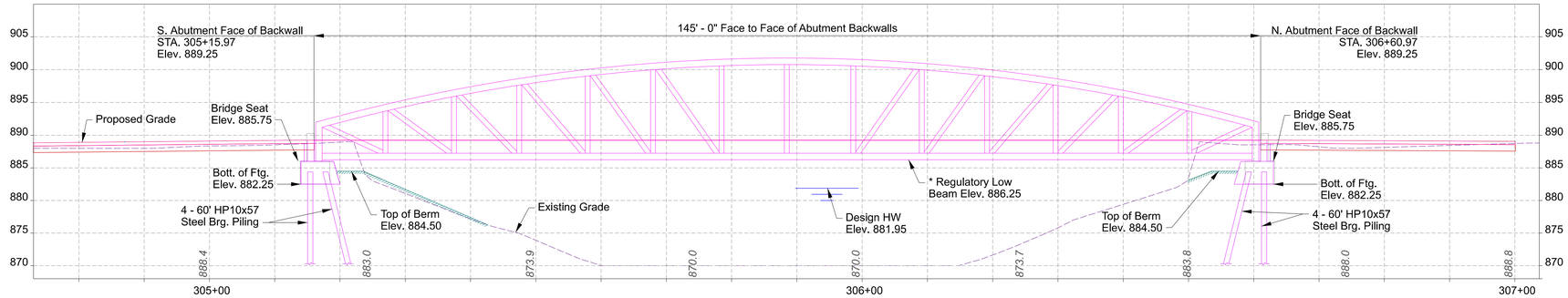
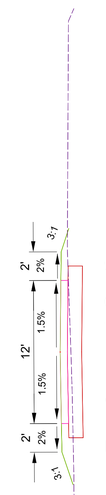


Section Thru Berm



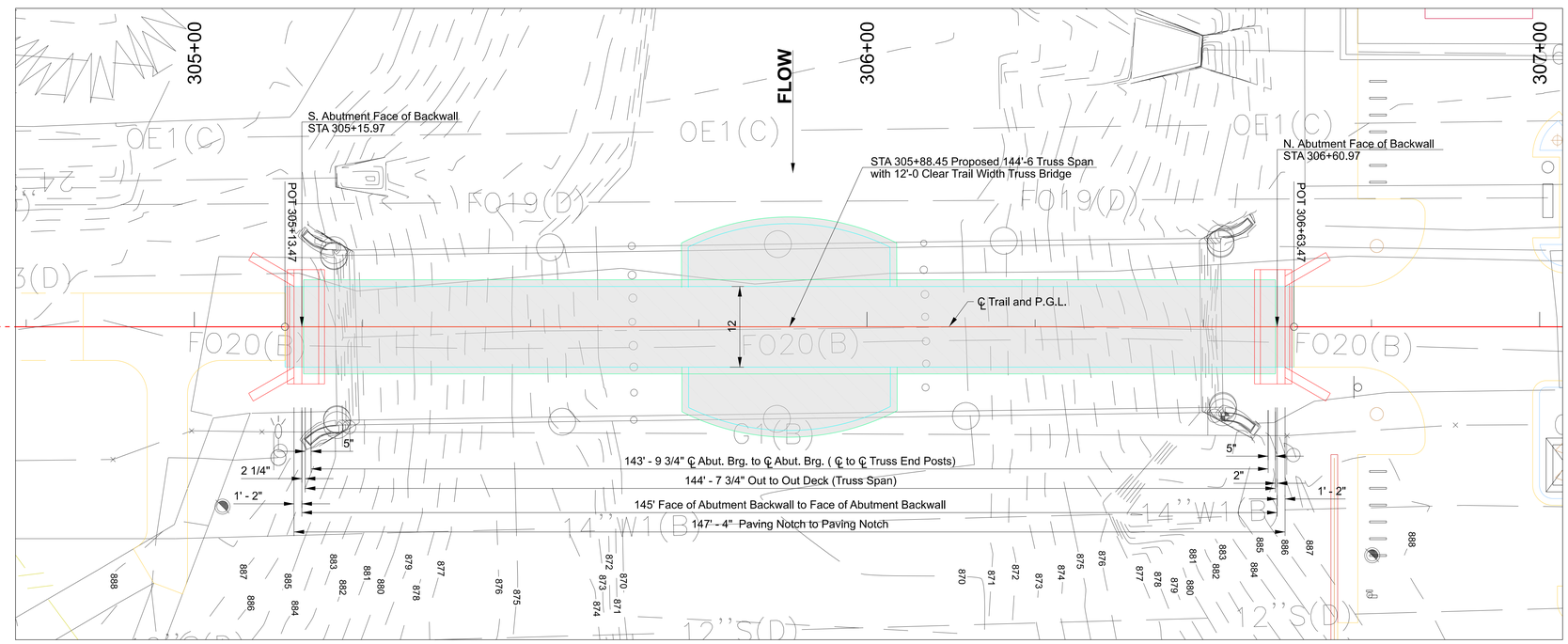
Longitudinal Section Along ℄ of Trail

Notes: Assumed distance from P.G.L. to low steel member is 3'-0".
Assumed distance from P.G.L. to abutment seat at front face of abutment back wall is 3' - 6".



Typ. Approach Section

(Shown at South Abutment - Looking North)



Longitudinal Section Along ℄ Trail

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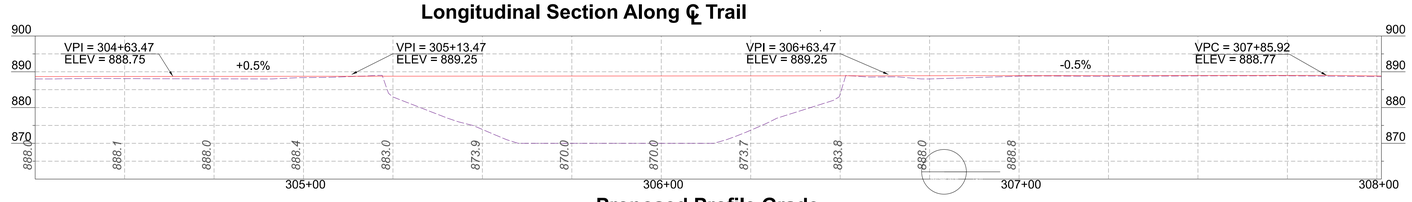
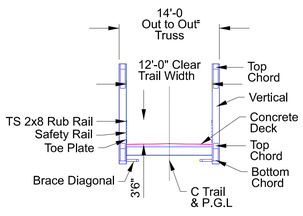


Proposed Profile Grade

Bridge Chamber not shown.



Section Thru Truss

(Looking North)

Utility Legend

--E1--	-	ELECTRIC LINE
--FO8--	-	FIBER OPTIC LINE
	-	POWER POLE
	-	POWER POLE
	-	POWER POLE

Utility Notes:

Utilities shown on this sheet are for information only, see Trail Design Sheet C300 of this plan set for utility information.

Location

Pedestrian Path
Over Linn Creek
T-84N R18W
Section 9
Marshall Township
Marshall County
Latitude 42.037369°
Longitude -92.922282°

Hydraulic Data

Q50 Flow profile = 7,960 cfs
Q50 Water Surface Elevation = 881.95 Ft.
Design Freeboard = 4.30 Ft.
Q100 Water Surface Elevation = 883.00 Ft.
Maximum Backwater = 0.52 Ft.

DESIGN FOR 0° SKEW

144'-6 TRUSS SPAN 12'-0 TRAIL
PRE-ENGINEERED STEEL TRUSS
RECREATIONAL TRAIL BRIDGE
SITUATION PLAN

STA. 305+88.45 JULY, 2024

MARSHALL COUNTY

LICENSED PROFESSIONAL ENGINEER
STEVEN A. KLOCKE
P16312
IOWA

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.

Steven A. Klocke, P.E. Date

License Number P16312

My License Renewal Date is December 31, 2025

Pages or sheets covered by this seal:

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= 10'
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:

Project No: 124.0187.01 Sheet V004

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

BRIDGE SITUATION PLAN

SNYDER & ASSOCIATES, INC.

2727 SW SNYDER BLVD
ANKENY, IOWA 50023
515-964-2020 | WWW.SNYDER-ASSOCIATES.COM

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Project No: 124.0187.01
Sheet V004

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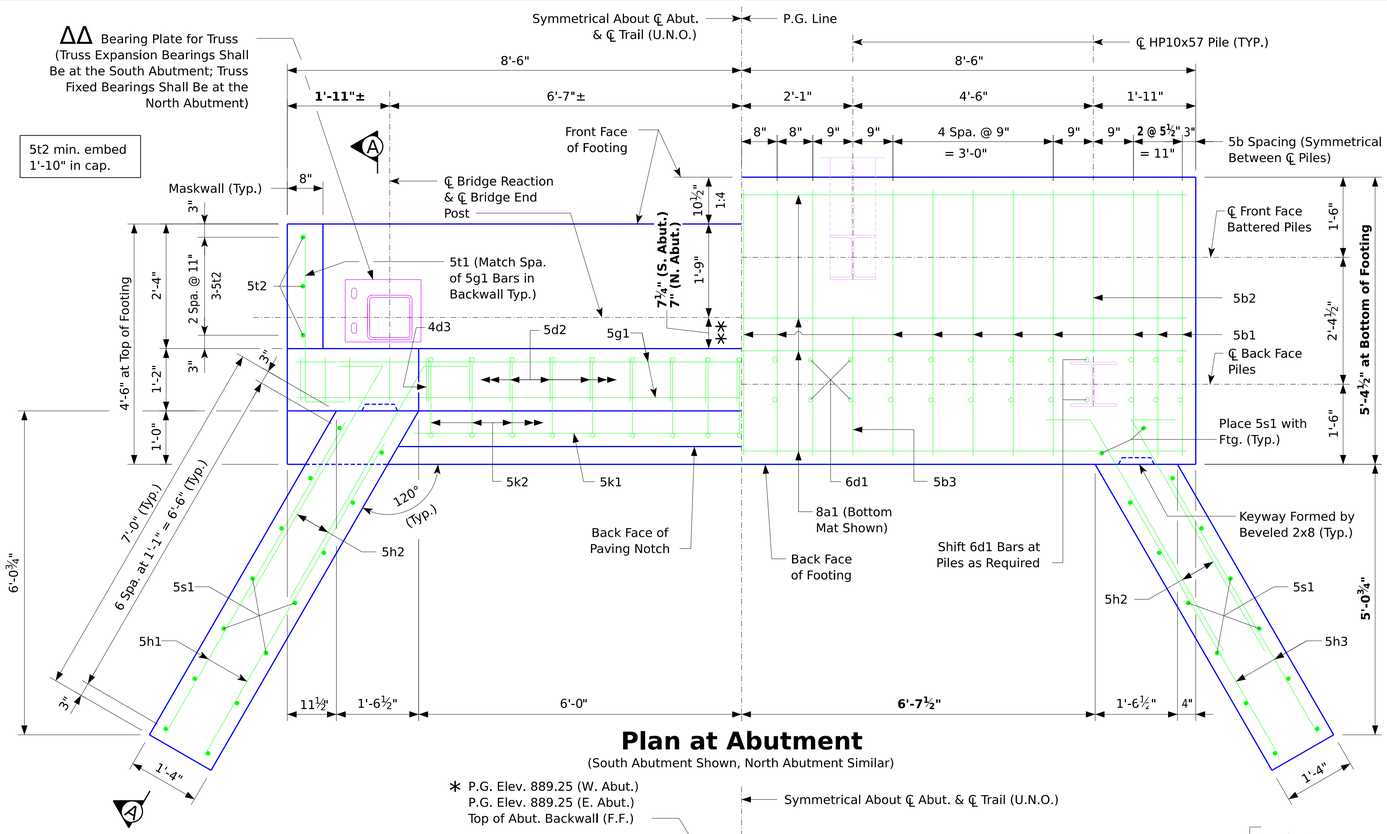
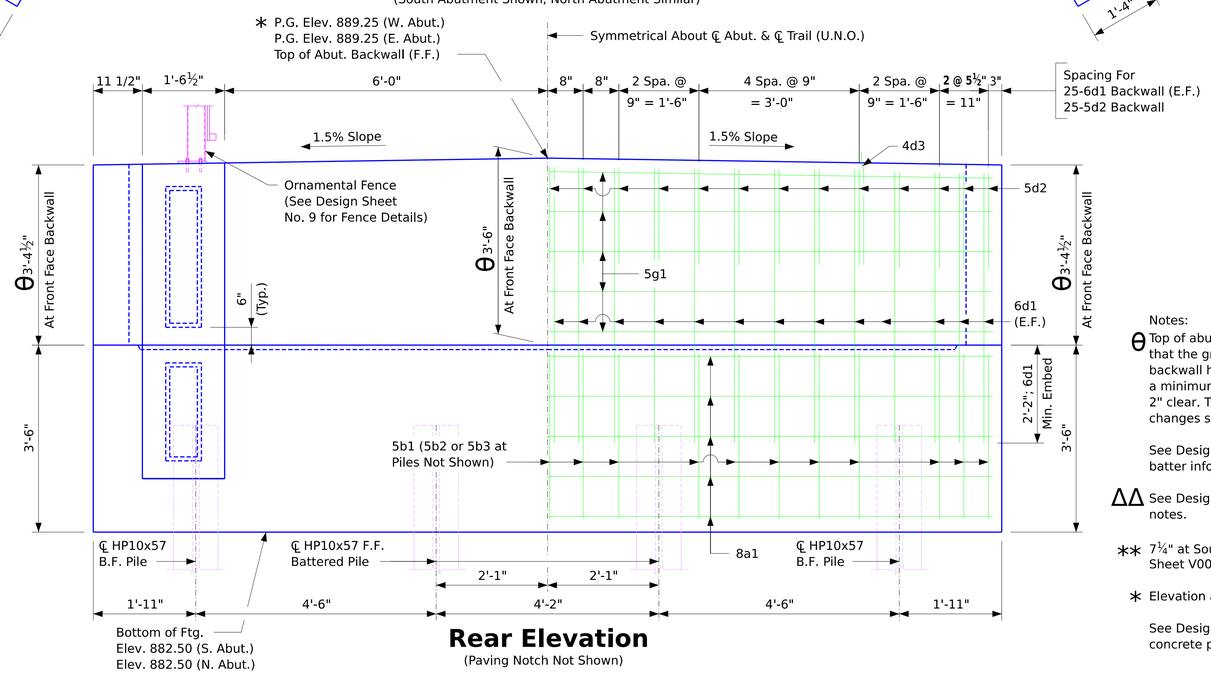


Plan at Abutment

(South Abutment Shown, North Abutment Similar)



Rear Elevation

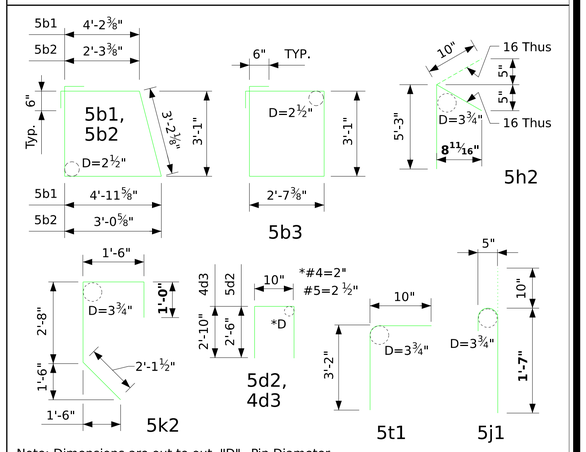
(Paving Notch Not Shown)

Reinforcing Bar List - One Abutment

Epoxy Coated Reinforcing

Mark	Bar	Location	Shape	No.	Length	Weight
	8a1	Cap, Longitudinal		16	16'-8"	712
	5b1	Cap, Hoops		21	16'-5"	360
	5b2	Cap, Hoops, Back Piles		2	12'-7"	26
	5b3	Cap, Hoops, Front Piles		2	12'-5"	26
	6d1	Backwall, Vertical		50	5'-6"	413
	5d2	Backwall, Hairpin		25	5'-10"	152
	4d3	Backwall, Curb		2	6'-6"	9
	5g1	Backwall, Longitudinal		10	16'-8"	174
	5h1	Wing, Longitudinal		20	6'-9"	141
	5h2	Wing, Longitudinal		32	6'-1"	203
	5h3	Wing, Longitudinal		12	5'-7"	70
	5j1	Paving Notch, Dowel Bar		17	2'-5"	43
	5k1	Paving Notch, Longitudinal		4	12'-2"	51
	5k2	Paving Notch, Vertical		17	7'-4"	130
	5s1	Wing, Vertical		28	5'-6"	161
	5t1	Maskwall, Horizontal		10	4'-0"	42
	5t2	Maskwall, Vertical		6	5'-1"	32
		Reinforcing Steel Epoxy Coated - Total (Lbs.)				2745

Bent Bar Details



Note: Dimensions are out to out. "D"=Pin Diameter.

Notes:

Θ Top of abutment footing elevation and backwall height may be adjusted by Contractor such that the grade elevation for top of bridge deck at the ℄ of the abutment is not changed. The backwall height may not be increased more than 3 inches. Bottom of footing shall be placed a minimum of 2 ft. below the finish berm elevation. Bar lengths shall be adjusted to provide 2" clear. The 1.5% cross slopes shall not be adjusted. All costs associated with these changes shall be borne by the Contractor.

See Design Sheet V006 for Section A-A and additional pile batter information.

ΔΔ See Design Sheet V006 for truss bearing and anchor bolt notes.

∗∗ 7¼" at South Abutment, 7" at North Abutment. See Design Sheet V006 for truss clearance coordination notes.

∗ Elevation at top of front face of abutment backwall.

See Design Sheet V007 for paving notch reinforcing details, concrete placement quantities, and pile driving notes.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS | Sheet V005
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:
Project No: 124.0187.01

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Project No: 124.0187.01

Sheet V005

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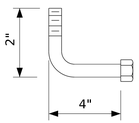
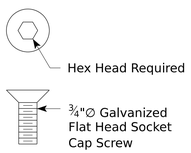
Notes:
4 - HP10x57 steel bearing piles required at each abutment.
All battered pile shall be trimmed to a horizontal line to aid in the placement of reinforcing.
Dimensions shown for piles are at bottom of footing. Batter piles 1:4 in the direction shown.
See Design Sheet V005 and V007 for additional abutment details.
See Design Sheet V005 for abutment reinforcing bar list.
See Design Sheet V007 for concrete placement quantities and abutment pile driving notes.

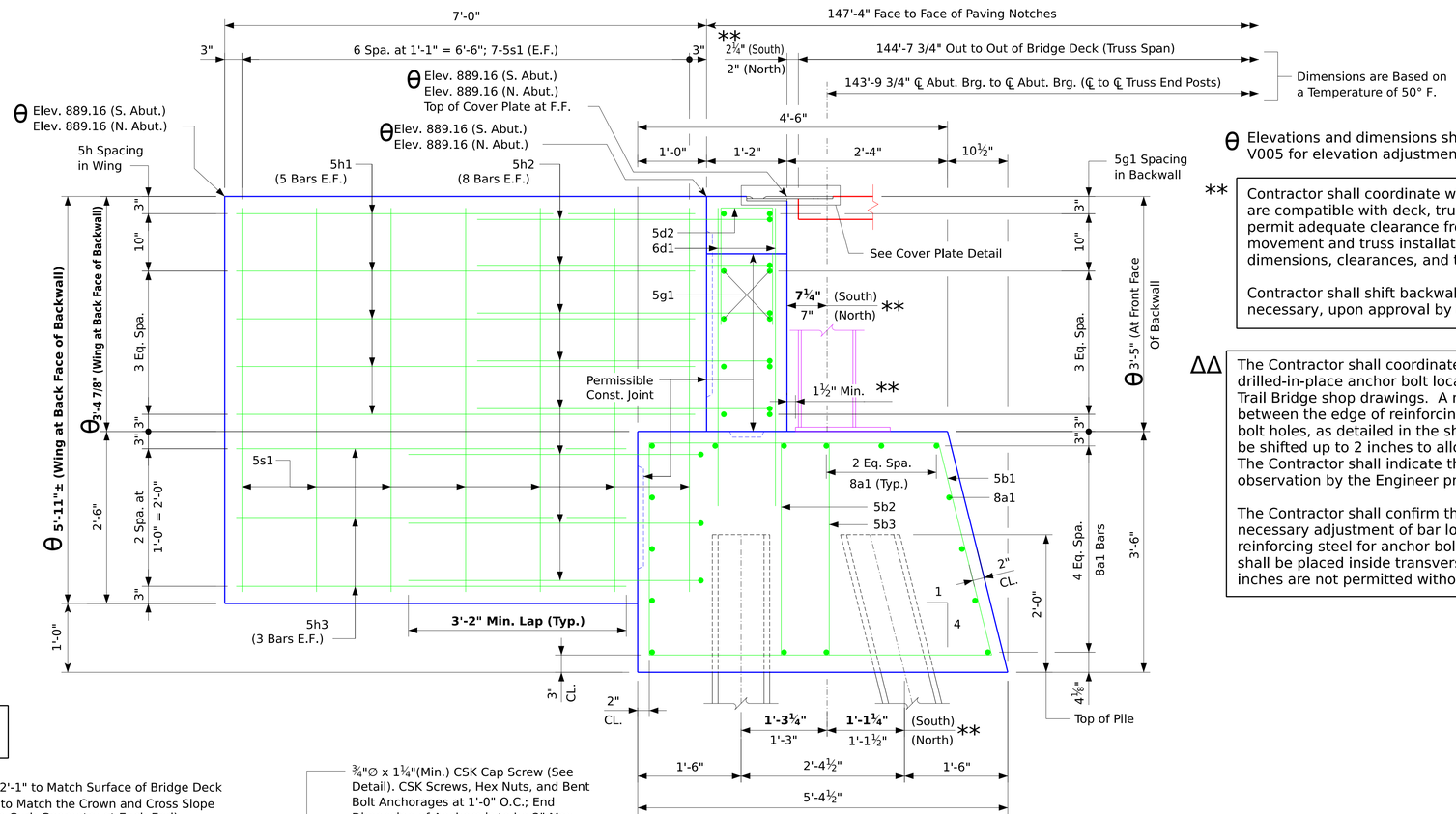


Bent Bolt Detail



Cap Screw Detail

Tread plate texture on plate shall meet ASTM A786 with raised figures. Figures shall be angular. Round figures will not be accepted.



θ Elevations and dimensions shown at inside face of wing. See Design Sheet V005 for elevation adjustment note.

** Contractor shall coordinate with Truss Manufacturer to confirm these dimensions are compatible with deck, truss framing, and bearing dimensions, and that they permit adequate clearance from abutment backwall to accomodate truss thermal movement and truss installation. Provide necessary documentation of dimensions, clearances, and thermal movement in shop drawing submittal.

Contractor shall shift backwall location slightly to achieve necessary clearance, if necessary, upon approval by the Engineer.

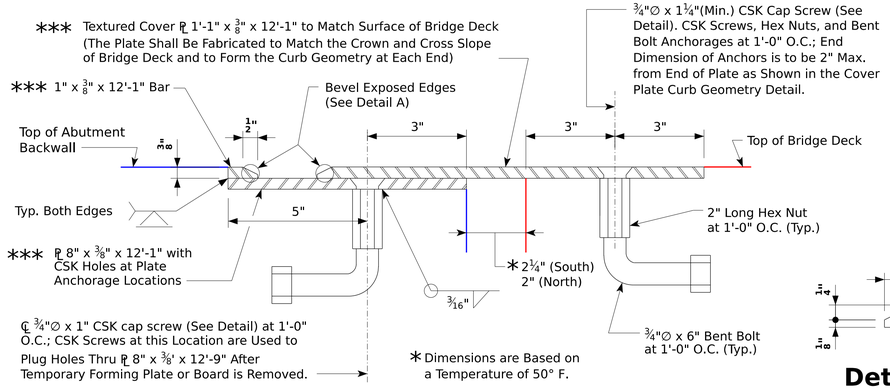
ΔΔ The Contractor shall coordinate reinforcing steel placement in the pile cap with the drilled-in-place anchor bolt locations detailed in the Pre-Engineered Steel Truss Trail Bridge shop drawings. A minimum of 2 inches of clearance shall be provided between the edge of reinforcing bars and the edge of slotted or standard anchor bolt holes, as detailed in the shop drawings. Longitudinal and transverse bars may be shifted up to 2 inches to allow drilling and installation of bridge anchor bolts. The Contractor shall indicate the intended bolt locations in the forms for observation by the Engineer prior to placement of abutment concrete.

The Contractor shall confirm that the dimensions of the reinforcing bars will permit necessary adjustment of bar locations prior to ordering material. Drilling through reinforcing steel for anchor bolt installation is not permitted. Longitudinal bars shall be placed inside transverse hoop bars as detailed. Bar shifts exceeding 2 inches are not permitted without approval by the Engineer.

Section A-A

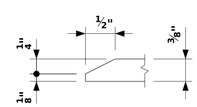
(Maskwall and Paving Notch Not Shown)

See Design Sheet V007 for paving notch and permissible construction joint details.

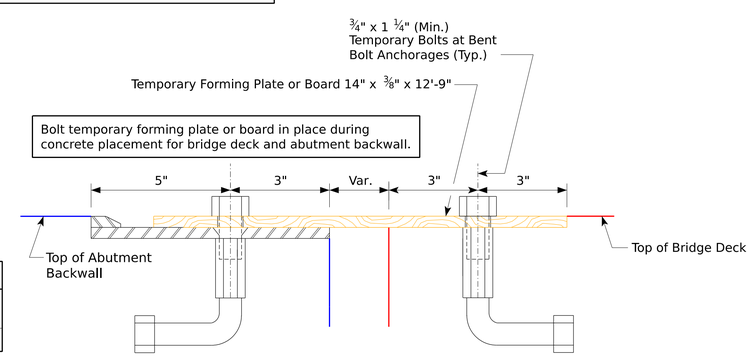


Cover Plate Detail

(Typical Both Abutments)



Detail A



Forming Detail

(Showing Temporary Forming Plate or Board for Bridge Joint Cover Plate)

Temporary forming plate or board may be re-used at other bridge abutment at Contractor's option.

Structural Steel	
Weight	2 Cover Plate Assemblies at 391 Lbs. Each = 782 Lbs.

Contractor shall take appropriate care to anchor plates in concrete to achieve a flush surface between the cover ℙ and top of bridge deck and adjoining top of abutment backwall.

Notes:
Contractor to verify embedment of bent bolts and CSK cap screws into 2" long hex nuts will allow full embedment of cap screw upon installation of cover plate.

The material used for the cover plate assembly is to be ASTM A36 steel. The bolts shall meet the requirements of ASTM A307. The plates, bolts, nuts and cap screws are to be galvanized in accordance with Iowa DOT Materials I.M. 410.01.

*** Deck width is intended to be 12'-1". Cover plate, anchorage plate, and bar to be fabricated to form the bridge deck cross slope and match the deck width prior to galvanizing.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:
Project No: 124.0187.01 | Sheet V006

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD
ABUTMENT DETAILS

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Project No: 124.0187.01
Sheet V006

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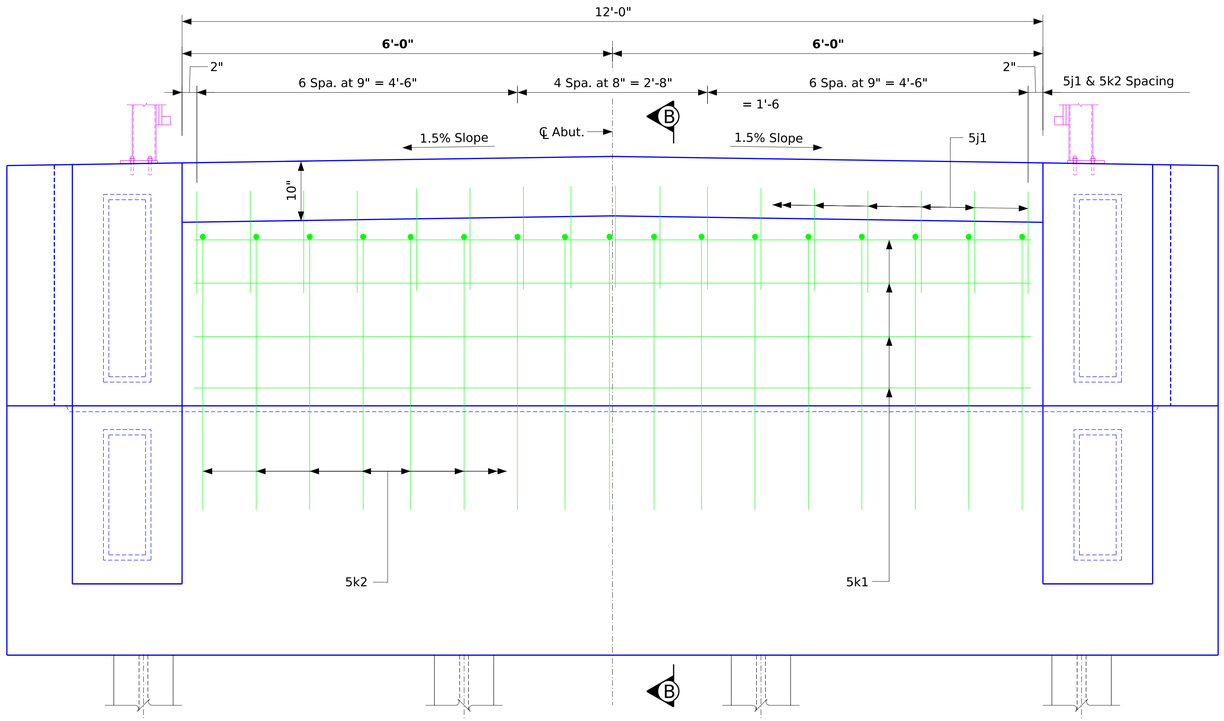
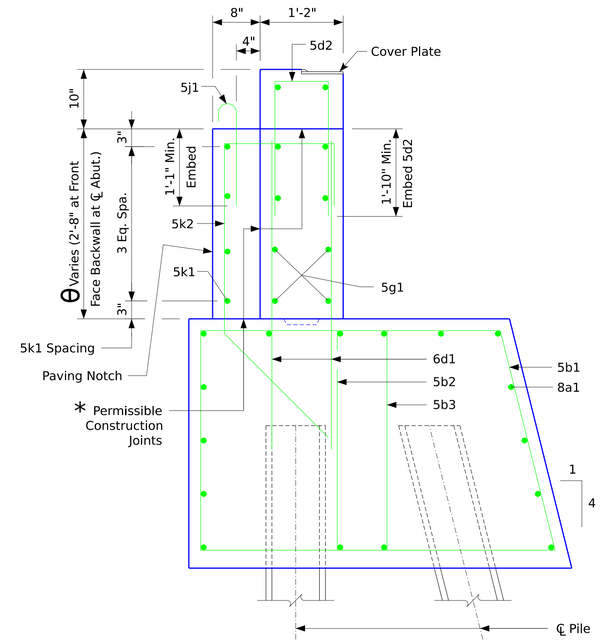


Rear Elevation

(Showing Paving Notch)



Section B-B

* If the permissible construction joints are used, the Contractor shall provide a roughened surface of ¼ inch amplitude at the joint, with smooth joint lines along exposed surfaces. All costs associated with utilizing premissible construction joints shall be borne by the Contractor. No additional quantity measurements or adjustments will be made for payment.

Concrete Placement Quantities

(One Abutment)

Location	Quantity
Pile Cap	10.9
Backwall, Above Permissible Joint	0.6
Backwall, Below Permissible Joint	2.0
Maskwalls (2 at 0.2)	0.4
Wingwalls (2 at 2.0)	4.0
Paving Notch	0.8
Total (Cu. Yds.)	18.7

South Abutment Pile Driving Notes:

The contract length of 60 feet for the south abutment piles is based on a cohesive soil classification, a total factored axial load per pile (Pu) of 128 kips, and a geotechnical resistance factor (Phi) of 0.65 for soil and 0.7 for rock end bearing.

The nominal axial bearing resistance for construction control was determined from a cohesive soil classification and a geotechnical resistance factor (Phi) of 0.65 for soil and 0.7 for rock end bearing. Piles are assumed to be driven from a start elevation at the bottom of MSE wall bearing elevation.

The required nominal axial bearing resistance for west abutment piles is 111 tons at end of drive or retap. The pile contract length shall be driven as per plan unless piles reach refusal. Construction control requires a weap analysis with bearing graph.

North Abutment Pile Driving Notes:

The contract length of 60 feet for the north abutment piles is based on a cohesive soil classification, a total factored axial load per pile (pu) of 128 kips, and a geotechnical resistance factor (Phi) of 0.65 for soil and 0.7 for rock end bearing.

The nominal axial bearing resistance for construction control was determined from a cohesive soil classification and a geotechnical resistance factor (Phi) of 0.65 for soil and 0.7 for rock end bearing. Piles are assumed to be driven from a start elevation at the bottom of footing.

The required nominal axial bearing resistance for east abutment piles is 111 tons at end of drive or retap. The pile contract length shall be driven as per plan unless piles reach refusal. Construction control requires a weap analysis with bearing graph.

Notes:
See Design Sheet V005 and V006 for additional abutment details.

Θ See Design Sheet V005 for abutment reinforcing bar list and elevation adjustment note.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:
Project No: 124.0187.01 | Sheet V007

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LINN CREEK TRAILHEAD

ABUTMENT DETAILS

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Project No: 124.0187.01

Sheet V007

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Ornamental Approach Fence Notes:

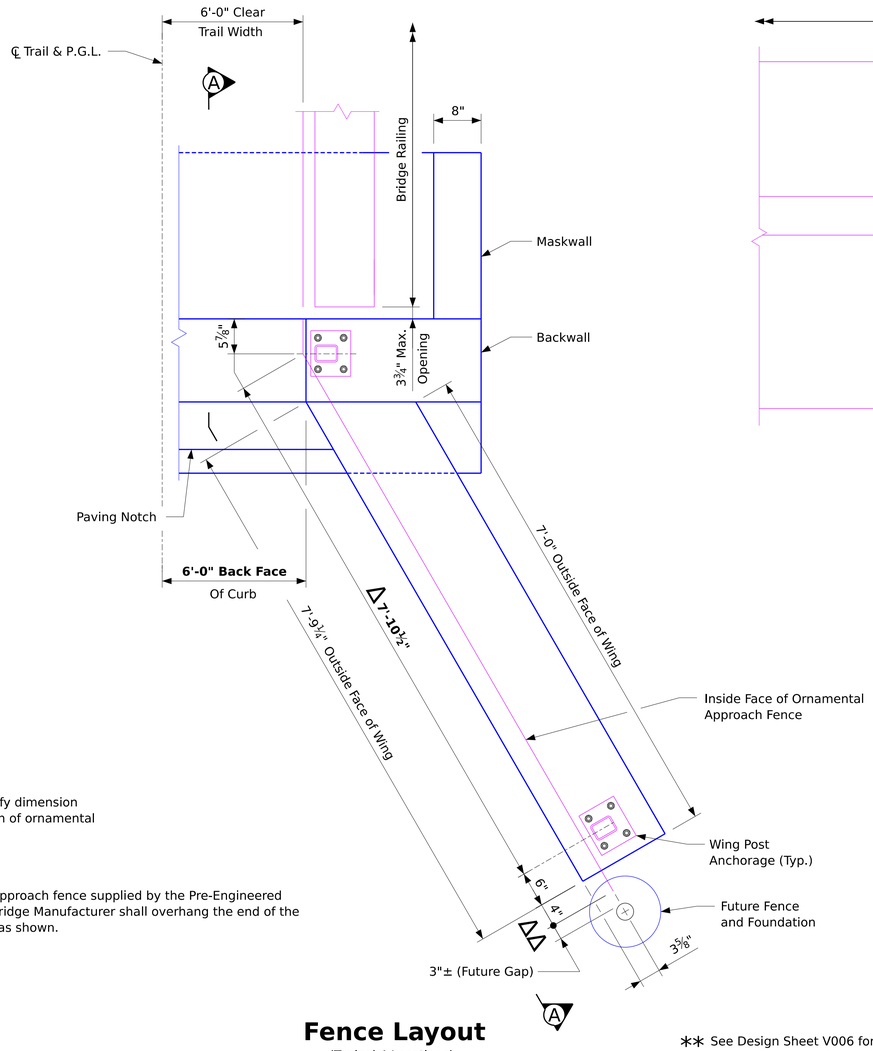
The ornamental approach fence shall be supplied by the Pre-Engineered Steel Truss Trail Bridge Manufacturer. The approach fence shall match the material and construction of the bridge railing. Rail geometry shall be in accordance with Section 2429 of the Standard Specifications.

The anchor bolts and base plates shall be supplied by the Pre-Engineered Steel Truss Trail Bridge Manufacturer. The base plates shall match the materials and construction of the bridge railing. The anchor bolts shall be in accorance with Iowa DOT Materials I.M. 453.09.

The approach fence and its anchorages shall be designed by an Engineer licensed in the State of Iowa. The design shall be in accordance with the referenced design standards.

Design calculations and shop drawings shall be submitted to the engineer for review prior to construction.

The ornamental approach fence shall be considered incidental to the price bid for "Pre-Engineered Steel Truss Trail Bridge".

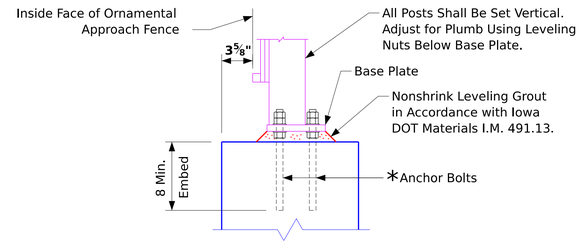


Δ Contractor to verify dimension prior to fabrication of ornamental approach fence.

ΔΔ The ornamental approach fence supplied by the Pre-Engineered Steel Truss Trail Bridge Manufacturer shall overhang the end of the wing by 4 inches as shown.

Fence Layout

(Typical 4 Locations)
Bridge Deck and Rub Rail Not Shown

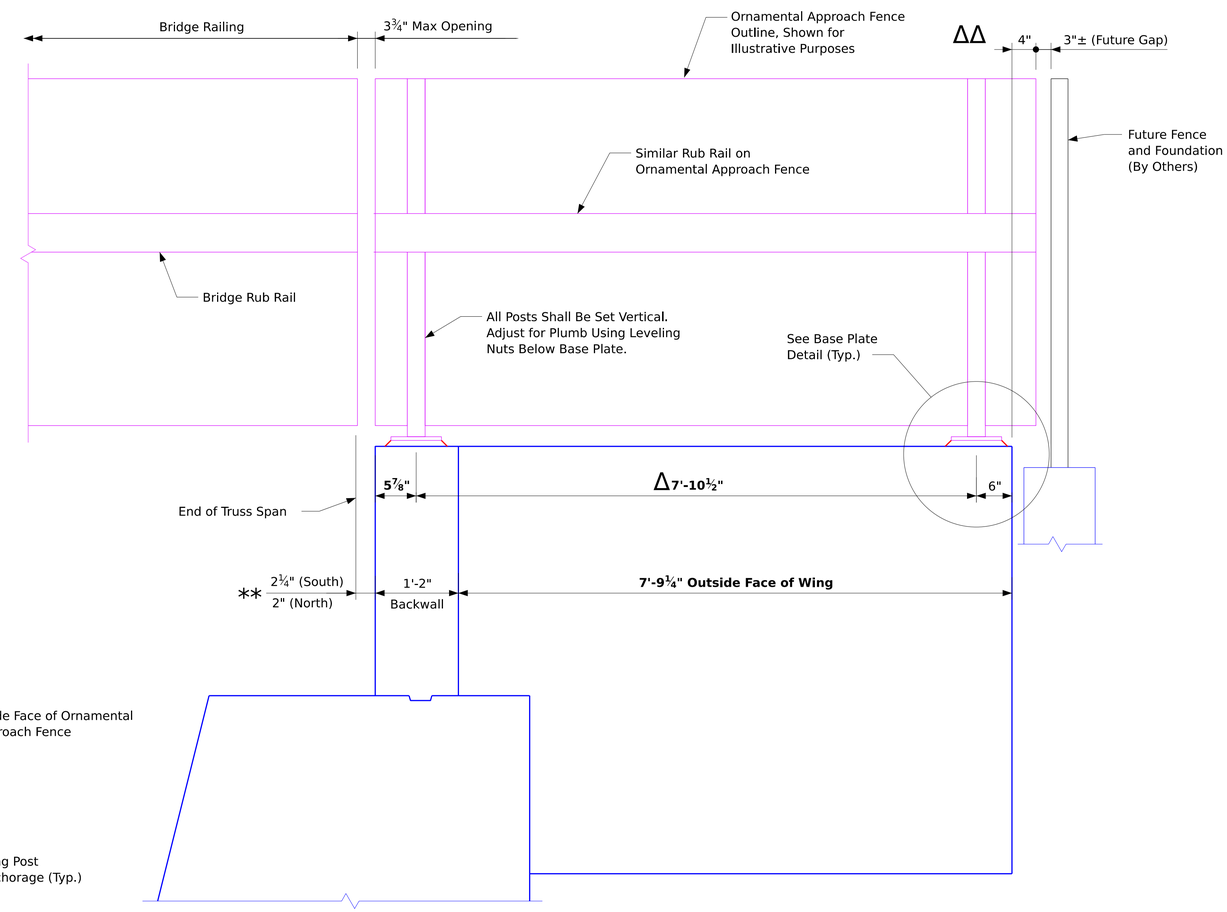


Base Plate Detail

Estimated Fence Quantities

Item	Units	Amount
Ornamental Approach Fence	Lin. Ft.	36.8
(For Information Only)		

* Furnish each anchor bolt with one nut and washer on top and bottom of the base plate and one jam nut on top. Anchor bolts, nuts, and washers shall be galvanized, and be in accordance with Iowa DOT Materials I.M. 453.09. The adhesive materials shall be in accordance with Iowa DOT Materials I.M. 491.11.



Section A-A

Maskwall, Truss, and Curb Not Shown

** See Design Sheet V006 for truss clearance coordination notes.

Contractor Note:
The Contractor shall take appropriate care to coordinate anchor bolt locations with wing reinforcing. Cutting of reinforcing steel for installation of rail anchor bolts will not be permitted.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:
Project No: 124.0187.01 | Sheet V008

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

ORNAMENTAL FENCE DETAILS

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Sheet V008

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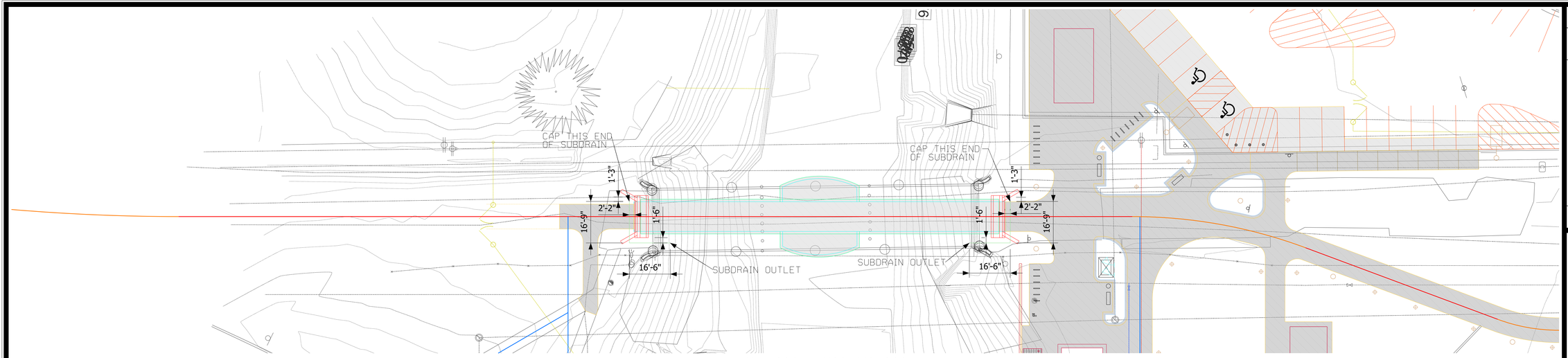
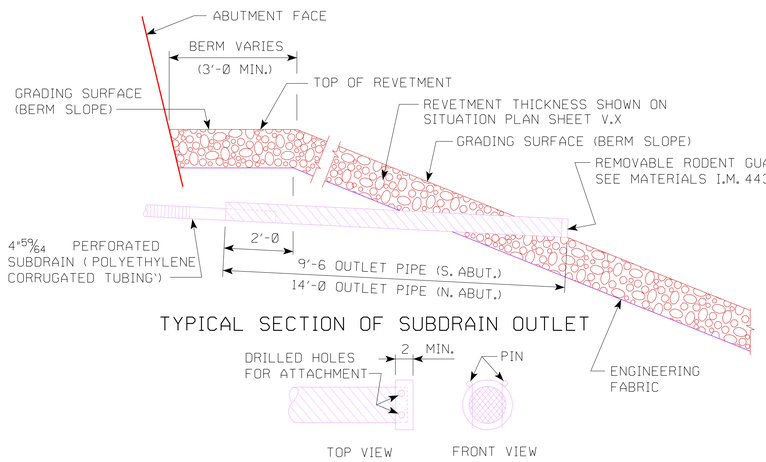


SITUATION PLAN

SHOWING SUBDRAIN LOCATIONS

N



TYPICAL SECTION OF SUBDRAIN OUTLET

REMOVABLE RODENT GUARD DETAILS

REVETMENT STONE (EMBEDDED) OUTLET DETAILS

SUBDRAIN OUTLET ELEVATIONS	
LOCATION	ELEVATION
SOUTH ABUTMENT	882.20
NORTH ABUTMENT	882.20

SUBDRAIN NOTES:

THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01.B. OF THE STANDARD SPECIFICATIONS.

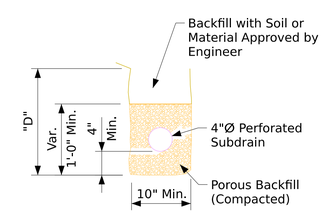
THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND ITS PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED WHEN REVETMENT IS PLACED. A CHECK WILL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT THE SUBDRAIN IS NOT DAMAGED AND IS DRAINING PROPERLY DURING THE BACKFILL PROCESS. IF A METAL OUTLET PIPE IS USED, IT SHALL BE 6 INCHES IN DIAMETER AND COUPLED TO THE 4 INCH DIAMETER SUBDRAIN IN ONE OF THE TWO FOLLOWING WAYS.

1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE').
2. INSERT 1'-0 OF THE 4"59/64 SUBDRAIN INTO THE 6"59/64 METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION'), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

NOTE:
SECTION A-A IS SHOWN ON SOUTH ABUTMENT BACKFILL DETAILS SHEET V.X.



Section C-C
(Typical)

"D" = Depth Required to Provide Proper Flow Line for Subdrain.

MARK	REVISION	DATE	BY

Engineer: RMV
Technician: TKV
Checked By: TLW
Date: 10/22/2024
Scale: 1"= 20'
Field Bk:
Pg:

Project No: 124.0187.01

Sheet V009

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LINN CREEK TRAILHEAD

SUBDRAIN DETAILS

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Project No: 124.0187.01

Sheet V009

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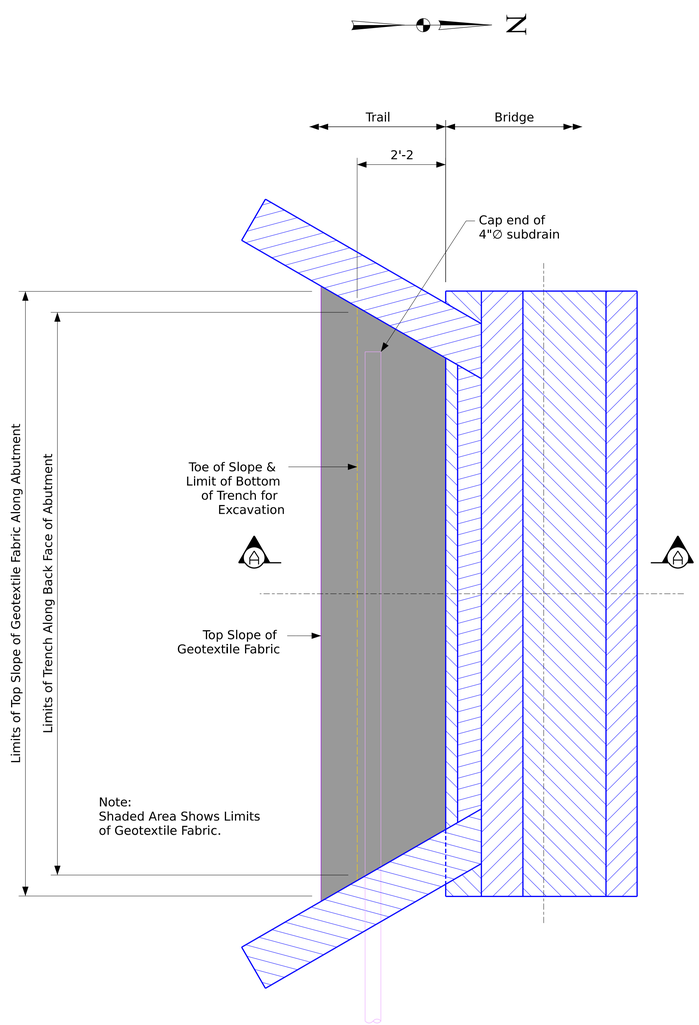


Abutment Plan

(South Abutment Shown, North Abutment Similar)

Abutment Backfill Process:

The base of the excavation subgrade behind the abutment is to be graded with a 4% slope away from the abutment footing and a 2% cross slope in the direction of the subdrain outlet. This excavation shaping is to be done prior to beginning installation of the geotextile and backfill material.

After the subgrade has been shaped, the geotextile fabric shall be installed in accordance with the details shown. The fabric is intended to be installed in the base of the excavation and extended vertically up the abutment backwall, abutment wing walls, and excavation face to a height that will be approximately 1 to 2 ft higher than the height of the porous backfill placement as shown in the "Backfill Details" on this sheet. The strips of the fabric placed shall overlap approximately 1 ft and shall be pinned in place. The fabric shall be attached to the abutment by using lath folded in the fabric and secured to the concrete with shallow concrete nails. The fabric placed against the excavation face shall be pinned.

When the fabric is in place, the subdrain shall be installed directly on the fabric at the toe of the rear excavation slope. A slot will need to be cut in the fabric at the point where the subdrain exits the fabric near the end of the abutment wing wall.

Porous backfill is then placed and leveled, no compaction is required.

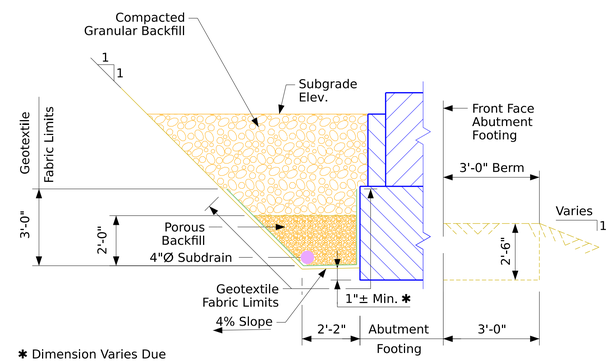
The remaining work involves backfilling with compacted granular backfill.

The cost of subdrains, porous backfill, granular backfill, and geotextile fabric furnished at the bridge abutments shall be included in the contract unit price bid for "Structural Concrete".

Note:

Subdrain shall slope downward 2%.
The geotextile fabric shall be in accordance with Article 4196.01, B, 6 of the Standard Specifications. If the engineering fabric is lapped the laps shall be a minimum of 1 ft in length, shingle fashion with up slope lap piece on top and stapled for continuity.

For Details not Shown on this Sheet which are Pertinent to this Structure, See Subdrain Details Sheet on Design Sheet V009.



✱ Dimension Varies Due to 2% Subdrain Slope.

Section A-A

Backfill Details

Note: Geotextile Fabric will be Attached to Face of Abutment Footing and Wings.

Note:
Refer to general notes sheet for excavation class 20 pay limits at each abutment.

MARK	REVISION	DATE	BY

Engineer: RMV | Checked By: TLW | Scale: 1"= NTS
Technician: TKV | Date: 10/22/2024 | Field Bk: | Pg:

Project No: 124.0187.01 | Sheet V010

MARSHALLTOWN, IOWA

LINN CREEK TRAILHEAD

BACKFILL DETAILS

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Project No: 124.0187.01
Sheet V010

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LINN CREEK TRAILHEAD

Marshalltown, Iowa | October 29, 2024

SNYDER & ASSOCIATES

Linn Creek Trailhead
Site Improvements

Table of Contents

The following documents are a part of this contract:

Document	Pages
Notice to Bidders	NTB - 1 to NTB - 2
Notice of Hearing	NH - 1
Instruction to Bidders	ITB - 1 to ITB - 2
Proposal	P - 1 to P - 11
Bid Bond	BB - 1 to BB - 2
Contract	C - 1 to C - 8
Performance, Payment and Maintenance Bond	PPM - 1 to PPM - 4
Notice to Proceed	NP - 1

Special Provisions

Part 1 – General Requirements	SP1 - 1 to SP1 - 5
Part 2 – Special Construction	SP2 - 1 to SP2 - 10

Specifications

Site Standard Specifications: The 2024 edition of the SUDAS Standard Specifications are adopted by reference, in their entirety, as part of these contract documents, except as modified by the Marshalltown Supplementary Specifications to Amend the Iowa Statewide Urban Design and Specifications (SUDAS) or as otherwise modified herein. The SUDAS Standard Specifications are available on-line at www.iowasudas.org or may be obtained by contacting the SUDAS Program at: 515-294-04674 or SUDAS Program, 2711 S. Loop Drive, Suite 4700, Ames, IA 50010. The Marshalltown Supplementary Specifications to Amend the Iowa Statewide Urban Design and Specifications (SUDAS) are available on-line at www.marshalltown-ia.gov/DocumentCenter/View/9087/2023-Marshalltown-Supplementary-Specifications.

Bridge Specifications: Iowa DOT Standard Specifications for Highway and Bridge Construction

Supplemental Specification Sections:

KCL

26 05 00	Common Work Results for Electrical
26 05 19	Low-Voltage Electrical Power Conductors and Cables

26 05 26 Grounding and Bonding for Electrical Systems
26 05 29 Hangers and Supports for Electrical Systems
26 05 33.13 Conduit for Electrical Systems
26 05 33.16 Boxes for Electrical Systems
26 05 53 Identification for Electrical Systems
26 09 23 Lighting Control Devices
26 56 00 Exterior Lighting

Snyder
31 20 00 Excavation and Earthwork
31 23 33 Trench Excavation and Backfill
31 25 00 Erosion and Sediment Control
32 13 13 Concrete Paving
32 13 14 Sidewalks, Shared Use Paths, and Driveways
32 17 23 Pavement Markings
32 92 19 Seeding
32 93 00 Plant Material and Planting
33 01 12 Water Testing and Disinfecting
33 14 16 Water Main and Appurtenances
33 14 23 Water Utility Distribution Equipment
33 31 13 Sanitary Utility Piping
33 31 14 Cleaning, Inspection, and Testing of Sewers
33 41 00 Subdrains and Footing Drain Collectors
33 42 11 Storm Utility Piping
33 42 31 Storm and Sanitary Structures
33 42 32 Cleaning, Inspection, and Testing of Structures

NOTICE TO BIDDERS

JURISDICTION OF **CITY OF MARSHALLTOWN** PUBLIC IMPROVEMENT PROJECT

LINN CREEK TRAILHEAD

Notice is hereby given that a public hearing will be held by the **City of Marshalltown, Iowa** on the proposed contract documents (plans, specifications, and form of contract) and estimated cost for the improvement at its meeting at **5:30 PM** on **NOVEMBER 11, 2024,** in said **City Council Chambers, at 10 West State Street, Marshalltown, IA 50158** for the **Linn Creek Trailhead.**

Sealed bids for the work comprising each improvement as stated below must be filed before **10:00 A.M.** according to the clock in the office of **the City Clerk** on **NOVEMBER 19, 2024** in the office of the **City Council Chambers, at 10 West State Street, Marshalltown, IA 50158**. Bids received after the deadline for submission of bids as stated herein shall not be considered and shall be returned to the late bidder unopened.

Sealed proposals will be opened and bids tabulated at **10:00 A.M**. on **NOVEMBER 19, 2024**, in the **City Council Chambers, at 10 West State Street, Marshalltown, IA 50158** for consideration by the **City Council of Marshalltown, Iowa** at its meeting on **NOVEMBER 25, 2024.**

Work on the improvement shall be commenced immediately upon approval of the contract by the Council, and be completed as stated below.

Hardcopies of the contract documents of the project documents may be obtained from Snyder & Associates, Inc. 2727 SW Snyder Blvd, Ankeny, Iowa 50023. Electronic contract documents are available at no cost by clicking on the "Bids" link at www.snyder-associates.com and choosing the **Linn Creek Trailhead** on the left. Project information, engineer's cost opinion, and planholder information is also available at no cost at this website. Downloads require the user to register for a free membership at QuestCDN.com.

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.

In accordance with Iowa statutes, a resident bidder shall be allowed a preference as against a nonresident bidder from a state or foreign country if that state or foreign country gives or requires any preference to bidders from that state or foreign country, including but 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.

General Nature of the Public Improvement

Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.

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 and will furnish after the award of contract a corporate surety bond, in a form acceptable to the Jurisdiction, for the faithful performance of the contract, in an amount equal to 100% of the amount of the contract. The bidder's security shall be in the amount fixed in the Instruction to Bidders and shall be in the form of a cashier's check or a certified check drawn on an FDIC insured bank in Iowa or on an FDIC insured bank chartered under the laws of the United States; or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States; or a bid bond on the form provided in the contract documents with corporate surety satisfactory to the Jurisdiction. The bid shall contain no condition except as provided in the specifications.

The **City of Marshalltown** reserves the right to defer acceptance of any bid for a period of sixty (60) calendar days after receipt of bids and no bid may be withdrawn during this period.

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 and the terms and conditions therein contained and shall guarantee the prompt payment of all material and labor, and protect and save harmless **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 two years from and after acceptance of the contract. The guaranteed maintenance period for new paving shall be four years.

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 insure 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.

Contractor shall substantially complete project work by **October 1, 2025,** and complete all work no later than **October 15, 2025**. Should the contractor fail to complete the work in this timeframe, liquidated damages of **$500** per calendar day will be assessed for work not completed within the designated contract term.

The **City of Marshalltown** does hereby reserve the right to reject any or all bids, to waive informalities, and to enter into such contract, or contracts, as it shall deem to be in the best interest of the jurisdiction.

This Notice is given by authority of the **City of Marshalltown, Iowa**

_____

Joel Greer, Mayor
Marshalltown, Iowa

NOTICE OF HEARING

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT, AND ESTIMATE OF COST FOR THE **LINN CREEK TRAILHEAD** FOR THE **CITY OF MARSHALLTOWN.**

Public Notice is hereby given that at **5:30 PM** on the **11TH OF NOVEMBER, 2024**, the **City Council of Marshalltown, Iowa** will, in the **City Council Chambers at 10 West State Street, Marshalltown, IA 50158** hold a hearing whereat said **City Council.** will resolve to adopt plans, specifications, form of contract and estimate of cost for the construction of the **Linn Creek Trailhead** and, at the time, date and place specified above, or at such time, date and place as then may be fixed, to act upon proposals and enter into contract for the construction of said improvements.

General Nature of the Public Improvement
Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.

At said hearing, the **City Council**, will consider the proposed plans, specifications, form of contract and estimate of cost for said project, the same now being on file in the **City Council Chambers, at 10 West State Street, Marshalltown, IA 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 comments/objections to said plans, specifications and form of contract or to the estimated cost of said improvements made by any interested party.

This Notice is given by authority of the **City of Marshalltown**

_____
Joel Greer, Mayor
Marshalltown, Iowa

Published in the _____

Bid Date: November 19, 2024
Time: 10:00 AM

INSTRUCTIONS TO BIDDERS

Project Name Linn Creek Trailhead

The work comprising the above referenced project shall be constructed in accordance with the 2024 edition of the SUDAS Standard Specifications and as further modified by the Marshalltown Supplementary Specifications to Amend the Iowa Statewide Urban Design and Specifications (SUDAS) (www.marshalltown-ia.gov/DocumentCenter/View/9087/2023-Marshalltown-Supplementary-Specifications) and special provisions included in the contract documents. The bridge construction specifications are controlled through the Iowa DOT Standard Specifications for Highway and Bridge Construction.
The terms used in the contract revision of the documents are defined in said Standard Specifications. Before submitting your bid, review the requirements of Division 1, General Provisions and Covenants, in particular the sections regarding proposal requirements, bonding, contract execution and insurance requirements. 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 your bid not to be read.

I. 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 shall be in the form of a cashier's check or a certified check, drawn on an FDIC insured bank in Iowa or drawn on an FDIC insured bank chartered under the laws of the United States; or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States; or a bid bond executed by a corporation authorized to contract as a surety in Iowa or satisfactory to the Jurisdiction. The bid bond must be submitted on the enclosed Bid Bond form as no other bid bond forms are acceptable. All signatures on the bid bond must be original signatures in ink; facsimile (fax) of any signature or use of an electronic signature on the bid bond is not acceptable. Bid security other than said bid bond shall be made payable to **City of Marshalltown.** "Miscellaneous Bank Checks," and personal checks, as well as "Money Orders" and "Traveler's Checks" issued by persons, firms, or corporations licensed under Chapter 533C of the Iowa Code, are not acceptable bid security.

II. SUBMISSION OF THE PROPOSAL AND IDENTITY OF BIDDER

A. 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, and 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 sealed in a separate envelope identified as Bid Security and attached to the outside of the bid proposal envelope. Any proposal received after the scheduled time for the receiving of proposals will be returned to the bidder unopened and will not be considered. If the Jurisdiction provides envelopes for proposals and bid security, bidders shall be required to utilize such envelopes in the submission of their bids.

B. 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.

1. PROPOSAL – Complete each of the following parts:

- Part B – Acknowledgment of Addenda, if any have been issued
- Part C – Bid Items, Quantities, and Prices

The following proposal attachments must be completed and attached:

- Part G – Identity of Bidder (including the Bidder Status Form)
- Part H – Identity of Subcontractors

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 or electronic signatures will not be accepted. The Bidder Status Form is required by the Iowa Labor Commissioner, pursuant to the Iowa Administrative Code rule 875-156.2(1). The Bidder must complete and submit the Bidder Status Form, signed by an authorized representative of the Bidder, with their bid proposal. Under Iowa Administrative Code rule 875-156.2(1), 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. The Worksheet: Authorized to Transact Business from the Labor Commissioner is including on the following page and can be used to assist Bidders in completing the Bidder Status Form.

The following documents must be submitted as printed. No alterations, additions, or deletions are allowed. If the Bidder notes a requirement in the contract documents that 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.

PROPOSAL

PROPOSAL: PART A – SCOPE

The City of Marshalltown, hereinafter called the "Jurisdiction," has need of a qualified contractor to complete the work comprising the below referenced improvement. The undersigned Bidder hereby proposes to complete the work comprising the below referenced improvement as specified in the contract documents, which are officially on file with the Jurisdiction, in the office of the City Clerk , at the prices hereinafter provided in Part C of the Proposal, for the following described improvements:

PROJECT DESCRIPTION:

Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.

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, QUANTITIES, AND PRICES

UNIT BID 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, Quantities, and Prices. In case of discrepancy, the Unit Bid Price governs. The quantities shown on the Proposal Attachment: Part C – Bid Items, Quantities, and Prices are approximate only, but are considered sufficiently adequate for the purpose of comparing bids. The Total Construction Cost plus any alternates selected by the Jurisdiction, shall be used only for comparison of bids. The Total Construction Cost, including any Add-Alternates, shall be used for determining the sufficiency of the bid security.

Item No.	Item Description	Unit	Quantity	Unit Price	Total Price
BASE IMPROVEMENTS					
1	MOBILIZATION/GENERAL CONDITIONS	LS	1	$	$
2	TREE REMOVAL	LS	1	$	$
3	PAVEMENT REMOVAL (HMA TRAIL, PARKING, OLD ROAD, AND GRAVEL AREA)	SY	1,875	$	$
4	REMOVE/SALVAGE PUMP TRACK	LS	1	$	$
5	REMOVE/DISPOSE CHAIN LINK FENCE	LF	350	$	$
6	REMOVE/DISPOSE GRAFFITI WALL	LS	1	$	$
7	STRIP, STOCKPILE, RESPOREAD TOPSOIL	CY	300	$	$
8	ON-SITE EARTHWORK	CY	1,500	$	$
9	IMPORT FILL ALLOWANCE	CY	1,000	$	$
10	IMPORT TOPSOIL	CY	100	$	$
11	EROSION CONTROL	LS	1	$	$
12	6" DEPTH PCC	SY	1,925	$	$
13	8" WIDTH PCC CONCRETE EDGER	LF	325	$	$
14	6" PCC CURB AND GUTTER	LF	60	$	$
15	SITE RETAINING WALL AT EAST OVERLOOK	LS	1	$	$
16	STEEL DECORATIVE HANDRAIL	LF	85	$	$
UTILITIES					
17	PERFORATED PE SUBDRAIN, 4" (ALLOWANCE)	LF	500	$	$

18	HDPE STORM SEWER	LF	340	$	$
19	RCP STORM SEWER	LF	105	$	$
20	RCP FLARED END SECTION	EA	2	$	$
21	NYLOPLAST STORM BASIN	EA	3	$	$
22	NYLOPLAST IN-LINE DRAIN	EA	2	$	$
23	CURB INTAKE	EA	2	$	$
24	STORM MANHOLE	EA	4	$	$
25	WATER SERVICE (2")	LF	25	$	$
26	METER PIT	LS	1	$	$
27	2" ISOLATION VALVE	EA	1	$	$
28	WINTERIZATION VALVE/BLOW-OFF	LS	1	$	$
29	DRINKING FOUNTAIN WITH BOTTLE FILLER, 1" SERVICE	LS	1	$	$
30	4" SANTIARY SEWER LINE	LF	15	$	$
31	SANITARY SEWER CLEANOUT	EA	1	$	$
32	DROP SERVICE MANHOLE (20' DEEP)	EA	1	$	$
33	SITE UTILITY SERVICE AND TRANSFORMER	LS	1	$	$
34	ELECTRICAL SERVICE AND TRANSFORMER	LS	1	$	$
35	SHELTER LIGHTING	LS	1	$	$
36	SHELTER POWER	LS	1	$	$
37	SITE LIGHTING (PEDESTRIAN)	LS	1	$	$
38	TECHNOLOGY (FIBER OPTIC, CAMERAS, ETC.)	LS	1	$	$
SITE AMENITIES					
39	MONOSLOPE EVENT SHELTER (30' X 16')	LS	1	$	$
40	MONOSLOPE PICNIC SHELTER (15' X 15')	LS	1	$	$

41	RESTROOM BUILDING (17' X 17')	LS	1	$	$
42	RESTROOM BUILDING FOUNDATION, STOOPS, SLAB	LS	1	$	$
43	OVERHEAD STRUCTURE AT OVERLOOK	LS	1	$	$
44	LAWN SEED AND HYDROMULCH	1.0	AC	$	$
45	NATIVE SEED AND HYDROMULCH	0.5	AC	$	$
46	LANDSCAPING (SHRUBS, PERENNIALS, ETC.)	EA	100	$	$
47	OVERSTORY TREES	EA	10	$	$
48	ORNAMENTAL TREES	EA	4	$	$
49	EVERGREEN TREES	EA	10	$	$
50	BIKE RACKS	EA	20	$	$
51	BIKE FIX-IT STATION	EA	1	$	$
52	BENCHES – CUSTOM METAL PANEL DESIGN	EA	5	$	$
53	TRASH RECEPTACLES – CUSTOM METAL PANEL DESIGN	EA	3	$	$
54	PICNIC TABLES	EA	3	$	$
55	TRAILHEAD KIOSK AND WAYFINDING SIGNAGE	LS	1	$	$
BRIDGE IMPROVEMENTS					
56	6th Street Bridge Demolition and Removal	LS	1	$	$
57	Truss Bridge, Modified Keystone with Overlooks, 145'x12'	LS	1	$	$
58	Erection Cost	LS	1	$	$
59	Concrete Deck	SF	1,800	$	$
60	Excavation Class 20	CY	130	$	$
61	Structural Concrete (Bridge)	CY	40	$	$
62	Reinforcing Steel, Epoxy Coated	CY	5,080	$	$
63	Piles, Steel, HP 10x57	LF	520	$	$

64	Railing and Overhead Panels Allowance	LS	1	$	$
65	Lighting Allowance	LS	1	$	$

TOTAL CONSTRUCTION COST $ _____

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 plus any selected alternates; and
3. 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 on this project on or before a date to be specified in a written notice to proceed by the Jurisdiction, and to fully complete the project by October 15, 2025 and to pay liquidated damages for noncompliance with said completion provisions at the rate of five hundred dollars ($500) 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 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 that all statements in this proposal are true; and

5. That the individual(s) executing this proposal have the authority to execute this proposal on behalf of the Bidder.

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

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.

_____
Bidder

_____
Signature

By _____
Name (Print/Type)

_____
Title

_____
Street Address

_____
City, State, Zip Code

_____
Telephone Number

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.

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.

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

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 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 a reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

PROPOSAL: PART H – IDENTITY OF SUBCONTRACTORS

In all instances in which the bidder intends to assign, sublet, or subcontract any portion of the work exceeding $25,000, the Bidder shall mark the appropriate box and shall provide a description of the work to be done by each subcontractor or assignee, the amount of each subcontract or the value of the work to be assigned, and the identity of each subcontractor or assignee below. The Bidder certifies that said subcontractors or assignees shall be utilized on this project, if acceptable to the City of Marshalltown. If the Bidder does not intend to utilize any subcontractors or assignees, or if each subcontract or assignment is less than $25,000; the Bidder shall so indicate by marking the appropriate box below. The Bidder need not identify material suppliers or manufacturers who do not provide labor at the worksite to incorporate such material or manufactured goods into the improvement.

The Bidder shall indicate the proposed use of subcontractors by completing the following:

☐ The Bidder does not intend to utilize any subcontractors or assignees, or the value of each subcontract or assignment is less than $25,000. The Bidder shall so indicate by marking the box at the left.

☐ The Bidder intends to utilize subcontractors or assignees, and the value of the subcontract or assignment is $25,000 or greater. The Bidder shall so indicate by marking the box at the left and shall report below only those subcontracts or assignments with a value of $25,000 or greater by providing a description of the work to be done by each subcontractor or assignee, the amount of each subcontract or the value of the work to be assigned, and the identity of each subcontractor or assignee in the space provided below. The Bidder certifies that said subcontractors or assignees shall be utilized on this project as stated below, if acceptable to the City of Marshalltown. The Bidder need not identify material suppliers or manufacturers who do not provide labor at the worksite to incorporate such material or manufactured goods into the improvement. *The Bidder may attach additional contact sheets, if necessary*

SUBCONTRACTOR IDENTITY

DESCRIPTION (Name, Address, Phone)	AMOUNT

BID BOND

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal, and, as Surety, are held and firmly bound unto_____, as Obligee, (hereinafter referred to as "the Jurisdiction"), in the penal sum of _____ _____dollars ($_____), or _____ percent of the amount bid in 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 described improvements: **Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.**

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 Marshall 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
_____ Printed Name of Attorney-in-Fact/Officer	_____ Printed Name
_____ Company Name	_____ Title
_____ Company Address	_____ Address
_____ City, State, Zip Code	_____ City, State, Zip Code
_____ Company Telephone Number	_____ Telephone Number

NOTE: All signatures on this bid bond must be original signatures in ink; copies, facsimile, or electronic signatures will not be accepted. This bond must be sealed with the Surety's raised, embossing 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.

CONTRACT NO. _____

DATE _____

CONTRACT

THIS CONTRACT, made and entered into at _____ this _____ day of _____, _____, by and between the _____ by its _____, upon order of its _____ hereinafter called the "Jurisdiction," and _____, hereinafter called the "Contractor."

WITNESSETH:

The Contractor hereby agrees to complete the work comprising the below referenced improvement as specified in the contract documents, which are officially on file with the Jurisdiction, in the office of the _____. This contract includes all contract documents. The work under this contract 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 said contract documents, and the Contract Attachment - Item 1: General, 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 - Item 2: Bid Items, Quantities, and Prices, 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 described improvements:

Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.

The Contractor agrees to perform said work for and in consideration of the Jurisdiction's payment of the bid amount of _____ dollars ($_____) which amount shall constitute the required amount of the performance, maintenance, and payment bond. The Contractor hereby agrees to commence work under this contract on or before a date to be specified in a written notice to proceed by the Jurisdiction and to fully complete the project _____; and to pay liquidated damages for noncompliance with said completion provisions at the rate of five hundred dollars ($ 500) for each calendar day thereafter that the work remains incomplete.

IN WITNESS WHEREOF, the Parties hereto have executed this instrument, in triplicate on the date first shown written.

JURISDICTION	CONTRACTOR
By _____	_____ Contractor
(Seal) ATTEST:	By _____ Signature
_____	_____ Title
FORM APPROVED BY:	_____ Street Address
_____ Attorney for Jurisdiction	_____ City, State, Zip Code
	_____ Telephone

CONTRACTOR PUBLIC REGISTRATION INFORMATION To Be Provided By:

1. All Contractors: The Contractor shall enter its Public Registration Number __ __ __ __ __ - __ __ 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. 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 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 Iowa Code, or as amended, governing foreign corporations.

NOTE: All signatures on this contract must be original signatures in ink; copies, facsimile, or electronic signatures 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 this 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 county, 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 ITEMS

CITY OF MARSHALLTOWN - TITLE VI CONTRACT LANGUAGE: During the performance of this contract, the contractor, for itself, its assignees, and successor in interest, (hereinafter referred to as the "contractor") agrees as follows:

1. Compliance with Regulation
   The contractor shall comply with the regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter referred to as DOT), Title 49, Code of Federal Regulations, part 21 (hereinafter referred to as the Regulations), as they may be amended from time to time, herein incorporated by reference and made part of this contract.

2. Nondiscrimination
   The contractor, with regard to the work performed during the contract, shall not discriminate on the grounds of race, color, sex, or national origin in the selection of and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall not participate either directly or indirectly in discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth is Appendix B of the Regulations.

3. Solicitation for Subcontracts, including Procurement of Materials and Equipment in all solicitations whether by competitive bidding or negotiations made by the contractor for work to be performed under a subcontract, including the procurement of material for leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulation relative to nondiscrimination on the grounds of race, color, sex, or national origin.

4. Information and Reports
   The contractor shall provide all information and reports required by the Regulation or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the City of Marshalltown, Iowa Department of Transportation or appropriate Federal Agency to be pertinent to ascertain compliance with such Regulation, orders and instructions. Where any information required of a contractors in exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the Iowa Department of Transportation or the appropriate Federal Agency as needed, and shall set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance
   In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the City of Marshalltown shall impose such contract sanctions as the Iowa Department of Transportation may determine to be appropriate, including, but not limited to:
   - Withholding of payments to the contractor under contract until the contractor complies and/or
   - Cancellation, termination, or suspension of the contract, in whole or in part.

6. Incorporations of Provisions
   The contractor shall include the provisions of paragraphs (1) through (5) in every subcontract, including procurement of materials and leases of equipment, unless exempt by Regulations or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontractor or procurement as the City of Marshalltown, Iowa Department of Transportation, or appropriate Federal Agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

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. Quantity changes that amount to 20% or less of the amount bid shall not affect the unit bid price.

Item No.	Item Description	Unit	Quantity	Unit Price	Total Price
BASE IMPROVEMENTS					
1	MOBILIZATION/GENERAL CONDITIONS	LS	1	$	$
2	TREE REMOVAL	LS	1	$	$
3	PAVEMENT REMOVAL (HMA TRAIL, PARKING, OLD ROAD, AND GRAVEL AREA)	SY	1,875	$	$
4	REMOVE/SALVAGE PUMP TRACK	LS	1	$	$
5	REMOVE/DISPOSE CHAIN LINK FENCE	LF	350	$	$
6	REMOVE/DISPOSE GRAFFITI WALL	LS	1	$	$
7	STRIP, STOCKPILE, RESPOREAD TOPSOIL	CY	300	$	$
8	ON-SITE EARTHWORK	CY	1,500	$	$
9	IMPORT FILL ALLOWANCE	CY	1,000	$	$
10	IMPORT TOPSOIL	CY	100	$	$
11	EROSION CONTROL	LS	1	$	$
12	6” DEPTH PCC	SY	1,925	$	$
13	8” WIDTH PCC CONCRETE EDGER	LF	325	$	$
14	6” PCC CURB AND GUTTER	LF	60	$	$
15	SITE RETAINING WALL AT EAST OVERLOOK	LS	1	$	$
16	STEEL DECORATIVE HANDRAIL	LF	85	$	$
UTILITIES					
17	PERFORATED PE SUBDRAIN, 4” (ALLOWANCE)	LF	500	$	$
18	HDPE STORM SEWER	LF	340	$	$

19	RCP STORM SEWER	LF	105	$	$
20	RCP FLARED END SECTION	EA	2	$	$
21	NYLOPLAST STORM BASIN	EA	3	$	$
22	NYLOPLAST IN-LINE DRAIN	EA	2	$	$
23	CURB INTAKE	EA	2	$	$
24	STORM MANHOLE	EA	4	$	$
25	WATER SERVICE (2”)	LF	25	$	$
26	METER PIT	LS	1	$	$
27	2” ISOLATION VALVE	EA	1	$	$
28	WINTERIZATION VALVE/BLOW-OFF	LS	1	$	$
29	DRINKING FOUNTAIN WITH BOTTLE FILLER, 1” SERVICE	LS	1	$	$
30	4” SANTIARY SEWER LINE	LF	15	$	$
31	SANITARY SEWER CLEANOUT	EA	1	$	$
32	DROP SERVICE MANHOLE (20’ DEEP)	EA	1	$	$
33	SITE UTILITY SERVICE AND TRANSFORMER	LS	1	$	$
34	ELECTRICAL SERVICE AND TRANSFORMER	LS	1	$	$
35	SHELTER LIGHTING	LS	1	$	$
36	SHELTER POWER	LS	1	$	$
37	SITE LIGHTING (PEDESTRIAN)	LS	1	$	$
38	TECHNOLOGY (FIBER OPTIC, CAMERAS, ETC.)	LS	1	$	$
SITE AMENITIES					
39	MONOSLOPE EVENT SHELTER (30’ X 16’)	LS	1	$	$
40	MONOSLOPE PICNIC SHELTER (15’ X 15’)	LS	1	$	$
41	RESTROOM BUILDING (17’ X 17’)	LS	1	$	$
42	RESTROOM BUILDING FOUNDATION, STOOPS, SLAB	LS	1	$	$

43	OVERHEAD STRUCTURE AT OVERLOOK	LS	1	$	$
44	LAWN SEED AND HYDROMULCH	1.0	AC	$	$
45	NATIVE SEED AND HYDROMULCH	0.5	AC	$	$
46	LANDSCAPING (SHRUBS, PERENNIALS, ETC.)	EA	100	$	$
47	OVERSTORY TREES	EA	10	$	$
48	ORNAMENTAL TREES	EA	4	$	$
49	EVERGREEN TREES	EA	10	$	$
50	BIKE RACKS	EA	20	$	$
51	BIKE FIX-IT STATION	EA	1	$	$
52	BENCHES – CUSTOM METAL PANEL DESIGN	EA	5	$	$
53	TRASH RECEPTACLES – CUSTOM METAL PANEL DESIGN	EA	3	$	$
54	PICNIC TABLES	EA	3	$	$
55	TRAILHEAD KIOSK AND WAYFINDING SIGNAGE	LS	1	$	$
BRIDGE IMPROVEMENTS					
56	6th Street Bridge Demolition and Removal	LS	1	$	$
57	Truss Bridge, Modified Keystone with Overlooks, 145'x12'	LS	1	$	$
58	Erection Cost	LS	1	$	$
59	Concrete Deck	SF	1,800	$	$
60	Excavation Class 20	CY	130	$	$
61	Structural Concrete (Bridge)	CY	40	$	$
62	Reinforcing Steel, Epoxy Coated	CY	5,080	$	$
63	Piles, Steel, HP 10x57	LF	520	$	$
64	Railing and Overhead Panels Allowance	LS	1	$	$
65	Lighting Allowance	LS	1	$	$

TOTAL CONTRACT COST $ _____

SURETY BOND NO. _____

PERFORMANCE, PAYMENT, AND MAINTENANCE BOND

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal (hereinafter the "Contractor" or "Principal" and _____, as Surety are held and firmly bound unto _____, as Obligee (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 following described improvements:

Linn Creek Trailhead, located at/near 802 S. 3rd Street, Marshalltown, Iowa 50158. Proposed improvements include demolition, earthwork and grading, concrete abutments, pre-engineered truss bridge system, water and sanitary sewer services, storm sewer, electric service and lighting, restroom structure, park structures, PCC pavement, landscaping, site restoration and associated work.

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 but the penal sum for maintenance shall be reduced to the sum of _____DOLLARS ($_____), which is the cost associated with those items shown on the proposal and in the Contract that require a maintenance bond period in excess of one year.

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:

1. 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.

2. PAYMENT: The Contractor and the Surety on this Bond 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 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 of the Iowa Code, which by this reference is made a part hereof as though fully set out herein.

3. MAINTENANCE: The Contractor and the Surety on this Bond hereby agree, at their own expense:

   A. To remedy any and all defects that may develop in or result from work to be performed under the Contract within the period of two (2) years 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;

   B. To keep all work in continuous good repair; and

   C. 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.

4. GENERAL: Every Surety on this Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:

   A. To consent without notice to any extension of time to the Contractor in which to perform the Contract;

   B. 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 20% of the total contract price, and that this bond shall then be released as to such excess increase; and

   C. 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.

   D. That no provision of this Bond or of any other contract shall be valid that limits to less that five years after the acceptance of the work under the Contract the right to sue on this Bond.

   E. 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, attorneys 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 against 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 regarding this Bond, the parties agree that the venue thereof shall be _____ 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) or not.

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.

Witness our hands, in triplicate, this _____ day of _____, _____.

Surety Countersigned By:

_____
Signature of Agent

_____
Printed Name of Agent

_____
Company Name

_____
Company Address

_____
City, State, Zip Code

_____
Company Telephone Number

PRINCIPAL:

_____
Contractor

By: _____
Signature

_____
Title

SURETY:

_____
Surety Company

By: _____
Signature Attorney-in-Fact Officer

_____
Printed Name of Attorney-in-Fact Officer

_____
Company Name

_____
Company Address

_____
City, State, Zip Code

_____
Company Telephone Number

FORM APPROVED BY:

_____
Attorney for Jurisdiction

NOTE:

1. **All signatures on this performance, payment, and maintenance bond must be original signatures in ink; copies, facsimile, or electronic signatures will not be accepted.**
2. **This bond must be sealed with the Surety's raised, embossing 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.**
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.**

NOTICE TO PROCEED

PROJECT: LINN CREEK TRAILHEAD

OWNER: City of Marshalltown, Iowa DATE: _____

TO: Contractor Name: _____

Contractor Address: _____

_____

You are hereby notified to commence work in accordance with the Contract dated _____, _____; on or before _____, and you are to complete the work as follows:

The Contractor shall fully complete the project BY **October 15, 2025**. being fully functional and open to the public for use and all improvements being ready for final acceptance. Should the Contractor fail to fully complete the work in this timeframe, liquidated damages of Five Hundred Dollars ($500) per working day will be assessed for work not completed within the designated Contract term(s).

_____

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by _____ of

_____ on this the _____ day of _____, 20____.

By: _____

Title: _____

SPECIAL PROVISIONS

FOR

PART 1 - GENERAL REQUIREMENTS

INDEX

1. DEFINITION AND INTENT
2. WORK REQUIRED
3. SALVAGE OF MATERIALS AND EQUIPMENT
4. PLANS AND SPECIFICATIONS
5. CONSTRUCTION FACILITIES
6. SUBMITTALS
7. STANDARDS AND CODES
8. MATERIALS TESTS
9. FIELD TESTS
10. MEASUREMENT AND PAYMENT
11. INSURANCE
12. INCIDENTAL CONTRACT ITEMS

1. DEFINITION AND INTENT

A. The Technical Specifications that apply to the materials and construction practices for this project are defined as follows:

1. The current edition of the Iowa SUDAS Standard Specifications, except as modified by these Special Provisions to the Technical Specifications.

2. The intent of the Technical Specifications is to describe the construction desired, performance requirements, and standards of materials and construction.

a. Engineer: Snyder & Associates, Inc., 2727 S.W. Snyder Blvd., Ankeny, Iowa 50023; Phone (515) 964-2020.

2. WORK REQUIRED

A. Work under this contract includes all materials, labor, equipment, transportation, traffic control and associated work for the construction of the Linn Creek Trailhead Project.

B. This project consists of one contract for all work described.

C. Schedule and coordinate the construction work to facilitate timely construction of the improvements.

3. SALVAGE OF MATERIALS AND EQUIPMENT

A. The City of Marshalltown retains first right of refusal for retaining any existing materials removed by the contractor during the course of construction.

B. The Contractor shall carefully remove, in a manner to prevent damage, all materials and equipment specified or indicated to be salvaged. The Contractor shall protect and store items as specified.

C. Any items damaged in removal, storage, or handling through carelessness or improper procedures shall be replaced by the Contractor in kind with new items.

4. PLANS AND SPECIFICATIONS

A. Provide one set of plans and specifications for each foreman and superintendent in charge of each crew on the job.

5. CONSTRUCTION FACILITIES

A. Provide telephone numbers where Contractor's representative can be reached during work days and on nights and weekends in the event of an emergency.

B. Provide and maintain suitable sanitary facilities for construction personnel for duration of work; remove upon completion of work.

C. Do not store construction equipment, employee's vehicles, or materials on streets open to traffic. Location for storage of equipment by Contractors is subject to approval by the City and Engineer.

D. The Contractor shall provide suitable storage facilities necessary for proper storage of materials and equipment.

6. SUBMITTALS

A. Provide construction schedule showing dates of starting and completing various portions of work.

B. Provide 3 copies plus copies required by Contractor if submitting hard copies. Submittals by email are encouraged. This information 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. Submit the following information for Engineer's review:

1. Testing reports as outlined in Sections 8 & 9.

2. Manufacturer's data for materials that are to be permanently incorporated into the project.

3. Details of proposed methods of any special construction required.

4. Submit purchase orders and subcontracts without prices.

5. Such other information as the Engineer may request to ensure compliance with contract documents.

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.

1. American Association of State Highway and Transportation Officials (AASHTO).

2. American Society for Testing and Materials (ASTM).

3. Iowa Department of Transportation Standard Specifications (Iowa DOT).

4. American National Standards Institute (ANSI).

5. American Water Works Association (AWWA).

6. American Welding Society (AWS).

7. Federal Specifications (FS).

8. Iowa Occupational Safety and Health Act of 1972 (IOSHA).

9. Manual of Accident Prevention in Construction by Associated General Contractors of America, Inc. (AGC).

10. Standards and Codes of the State of Iowa and the ordinances of the City of Marshalltown, Iowa.

11. Other standards and codes which may be applicable to acceptable standards of the industry for equipment, materials and installation under the contract.

8. MATERIALS TESTS

A. Material testing is incidental to construction and will be completed by an independent testing laboratory retained by the Contractor and approved by the Engineer. Testing shall not be completed by an employee of the Contractor. Testing shall meet the requirements of the Iowa SUDAS Standard Specifications.

B. Coordinate all material testing with the Engineer.

C. Provide transportation of all samples to the laboratory.

D. Do not ship materials to the project site until laboratory tests have been furnished showing compliance of materials with specifications.

E. Provide gradation and materials certifications for all granular materials. Certify that sources of Portland Cement and aggregates are Iowa DOT approved.

F. Certify that materials and equipment are manufactured with applicable specifications.

9. FIELD TESTS

A. Field testing is incidental to construction and will be completed by an independent testing laboratory retained by the Contractor and approved by the Engineer. Testing shall not be completed by an employee of the Contractor. Testing shall meet the requirements of the Iowa SUDAS Standard Specifications.

B. Coordinate all field testing with the Engineer.

C. If test results do not meet those specified, the Contractor shall make necessary corrections and repeat testing to demonstrate compliance with the specifications. Contractor shall pay all costs for retesting.

10. MEASUREMENT AND PAYMENT

A. Contract unit or lump sum prices are full compensation for furnishing all materials, equipment, tools, transportation and labor necessary to construct and complete each item of work as specified. No separate payment will be made for work included in this project except as set forth in the bid items. All other items of work are incidental to construction.

11. INSURANCE

A. Refer to Iowa Department of Transportation Standard Specifications Article 1107.02 for insurance requirements. The City of Marshalltown and Snyder &

Associates, Inc. shall be listed as additional insured on the certificate of insurance.

12. INCIDENTAL CONTRACT ITEMS

A. The following list includes major items that are incidental to the project and will not be paid for as separate bid items. Other items may be designated as incidental under certain bid items.

- Dewatering and handling storm water flow during construction
- Excavation, verification, and protection of existing utilities
- Material & Field testing
- Construction fencing
- Coordination and cooperation with utility companies
- Coordination and cooperation with affected property owners
- Coordination and cooperation with the City of Marshalltown
- Protection of existing utilities and light poles
- Handbill notification of street closures & utility disruption to affected residents
- Locating of existing utilities, potholing if necessary
- Monitoring weather conditions
- Finish grading
- Watering of seeded and sodded areas
- Repair of field tiles, if encountered
- Dust control measures
- Construction staging & phasing
- Working backfill to reduce moisture content
- Curb and pavement backfill
- Fixture adjustment

END OF SECTION

SPECIAL PROVISIONS

FOR

PART 2 - SPECIAL CONSTRUCTION

INDEX

1. GENERAL
2. EXISTING UTILITIES
3. PROJECT SUPERVISION
4. COORDINATION WITH OTHERS
5. CONSTRUCTION LIMITS
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7. CONSTRUCTION PHASING
8. CONSTRUCTION STAKING
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10. POSTAL SERVICE
11. SIDEWALK ACCESS
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13. EROSION/POLLUTION PREVENTION PLAN
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19. CONCRETE PAVEMENT (PCC)
20. EXCAVATION AND BACKFILL
21. STORM SEWERS AND STRUCTURES
22. FIXTURE ADJUSTMENTS
23. RESTROOM BUILDING

1. 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. Cooperate with the City of Marshalltown and the Engineer to minimize inconvenience to property owners 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 specified time of construction.

D. Install and maintain orange safety fence around all open trenches or open structures when left unattended.

E. Provide surface restoration and clean up as construction progresses.

2. 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 Owner.

B. Prior to construction, 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. 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. Utility companies will relocate utility infrastructure in direct conflict with line and grade of the work during construction. 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 Owner and affected property owners 48 hours prior to any planned utility service interruptions.

G. If utility work does occur during the construction period, work schedules from the contractor and from the utility companies will be submitted to the Engineer for coordination to obtain mutual acceptable schedules, if possible.

H. Existing utilities shall remain in substantially continuous operation during construction. 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 Owner 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.

3. PROJECT SUPERVISION

A. The Prime Contractor shall be represented in person at the construction site at all times that construction operations are proceeding by a qualified superintendent or other designated, qualified representative capable of providing adequate supervision. The superintendent or representative must be duly authorized to receive and execute instructions, notices and written orders from the Engineer.

B. Issues that arise during construction relating to traffic control, construction staging, resident notifications, mail service, garbage service, access to residences, etc. are the responsibility of the Prime Contractor.

C. A meeting with the Contractor, Engineer and Owner will be held at the project site before construction to coordinate the construction work.

D. Refer to the Iowa Statewide Urban Specifications for Public Improvements (SUDAS) Division 1 – General Provisions and Covenants, Section 1080 – Prosecution and Progress, Section 1.10 Contractors Employees, Methods, and Equipment for additional requirements.

4. COORDINATION WITH OTHERS

A. Cooperate and coordinate construction with the City of Marshalltown, adjacent businesses, utility companies, affected property owners and other contractors working in vicinity of this project.

B. It is the Contractor′s responsibility to schedule and coordinate work to minimize construction delays and conflicts.

C. Contractor to prepare handbill notification of street closures to affected residents one (1) week prior to anticipated street closure.

5. CONSTRUCTION LIMITS

A. Confine the construction operations within the construction limits shown on the plans, consisting of street right-of-way and easements shown.

B. Do not store equipment, vehicles or materials within the right-of-way of any streets open to traffic at any time without approval of the City.

6. CONSTRUCTION SCHEDULE

A. The Contractor will prepare and submit to the Engineer for approval a project schedule that will assure the completion of the project within the time specified.

B. The Contractor shall be required to meet the final completion date as specified in the written Notice to Proceed.

C. Contractor shall substantially complete project work by October 1, 2025, and complete all work no later than October 15, 2025. Should the contractor fail to complete the work in this timeframe, liquidated damages of $500 per calendar day will be assessed for work not completed within the designated contract term.

D. Notify the City and property owners at least one (1) week prior to any street closures.

1. Notify all residents affected by the street closures by written notice placed on the front door of residence.

2. Include the following items in the notice:

- The proposed date of street construction
- The estimated schedule for completion of work
- The estimated date for reopening of the street
- Contact information for the Contractor

7. CONSTRUCTION PHASING

A. Contractor to coordinate and schedule all work to keep job execution time to a minimum. Contractor is to proceed in a sequential manner to assure rapid progression of project. Job schedule shall be submitted to Engineer prior to start of construction. The Engineer reserves the right to assist the Contractor in developing construction schedule to keep inconvenience to residents and businesses along the routes to a minimum.

8. CONSTRUCTION STAKING

A. Construction Staking will be provided by the Contractor.

9. GARBAGE COLLECTION

A. If work takes place on a normal garbage collection day, Contractor shall coordinate collection and hauling of garbage from individual properties to a location coordinated with the local garbage collection agencies operating in the project areas. Return trash cans to individual properties.

B. Coordination of garbage collection shall be paid for as part of Maintenance of Solid Waste Collection bid item.

10. POSTAL SERVICE

A. Coordinate delivery of mail with U.S. Postal Service. Coordinate location of temporary mailboxes with U.S. Postal Service.

B. Maintain postal service at all times. Provide access to all residences along the project for mail carriers. If access cannot be maintained, provide and install temporary mailboxes at the end of each street or as required by the U.S. Postal Service so that mail delivery is maintained on a daily basis.

11. SIDEWALK ACCESS

A. Sidewalks and ramps shall be kept open to pedestrian traffic at all times when work allows. Contractor shall install type II barricades with a sign “SIDEWALK CLOSED” when pedestrian access is not permissible.

B. No materials or equipment shall be stored on sidewalks.

12. DISPOSAL

A. Remove from 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.

B. Dispose of materials in accordance with applicable laws and ordinances. Disposal sites are subject to the review and approval of the Engineer.

1. Burning of brush and other debris is not permitted. Contractor responsible for selecting disposal site.

2. Dispose of broken concrete, asphalt, granular material, rubble, excess or unsuitable excavated material. Contractor is responsible for selecting disposal site.

3. Cooperate with all applicable City, State and Federal agencies concerning disposal of materials.

4. The Owner has the first right to any excess materials from construction.

13. EROSION/POLLUTION PREVENTION PLAN

A. The disturbed area for this site is less than 1 acre so a Storm Water Pollution Prevention Plan (SWPPP) is not required for this project.

14. DEWATERING

A. Perform all construction work in dry conditions.

B. Submit dewatering methods to the Engineer for review. Obtain the Engineer′s approval on methods prior to construction.

C. Groundwater levels are subject to variation. No additional compensation will be permitted due to high groundwater conditions.

D. If excavation encounters only cohesive soils with no wet sand seams or layers, it may be possible to control water seepage by draining groundwater to temporary construction sumps and pumping it outside the perimeter of the excavation.

E. Do not pump water from open excavation in sand and gravel below the natural ground water level.

F. 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.

1. Install dewatering system (well points or shallow wells) when working in cohesionless soils.

2. Costs of installing and operating dewatering system are incidental.

G. Provide for handling surface water encountered during construction.

1. Prevent surface water from flowing into excavation, remove water as it accumulates.

2. Divert storm sewer flow around areas of construction.

3. Do not use sanitary sewers for the disposal of trench water.

H. Backfill pipe and structures prior to stopping dewatering operations. Do not lay pipe or construct concrete structures on excessively wet soils.

I. The costs of handling both surface water and groundwater are incidental.

15. TRAFFIC CONTROL

A. 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.

B. 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).

C. Adjustments to the traffic control or the addition of flaggers will be required if, in the opinion of the Engineer, undue traffic congestion occurs.

D. Provide continuous access for police, fire, and other emergency vehicles.

16. REMOVALS

A. Pavement Removal

1. Includes existing street, driveway, sidewalk as shown in the construction drawings.

2. Full-depth saw-cut the concrete at the removal limits (incidental).

B. Miscellaneous Removals

1. Do not remove any items within the street right-of-way that are not specifically marked for removal on the construction drawings.

17. TEMPORARY FENCES

A. 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. Provide orange plastic mesh safety fence with a nominal height of 48". Support fence securely on driven posts in vertical position without sagging.

1. Materials: Iowa DOT Section 4188.03.

2. Use unless required otherwise.

C. Temporary fencing installed around open excavations or material storage areas is incidental to construction and will not be measured for payment.

D. Remove temporary fencing upon completion of construction.

18. RESPONSIBILITY OF CONTRACTOR

A. Supervision of the work.

B. Protection of all property from injury or loss resulting from construction operations.

C. Replace or repair objects sustaining any such damage, injury or loss to satisfaction of Owner and Engineer.

D. Cooperate with Owner, 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. Keep cleanup current with construction operations.

F. Comply with all Federal, State of Iowa, and City of Marshalltown, Iowa laws and ordinances.

19. CONCRETE PAVEMENT (PCC)

A. Comply with IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

B. Coarse Aggregate: USE CLASS 2 DURABILITY AGGREGATE, IDOT, SECTION 4115.04.

C. Mix Design: IDOT C-4 and M-4 mix shall be used for all concrete as specified on the construction drawings.

D. Restore core holes by tamping non-shrink cement grout into hole; finish and texture surface.

E. The use of maturity testing as per IDOT IM 383 will be allowed with a minimum of one set of cylinders made each day to verify compressive strength.

F. Each truck load of concrete must be identified by an acceptable plant charge ticket showing plant name, contractor, project name, date, quantity, class, and time batched.

G. Provide cold weather protection as specified for temperatures below 25 degrees F. for all concrete placed after November 15.

20. EXCAVATION AND BACKFILL

A. Comply with IOWA DOT STANDARD SPECIFICATIONS, except as modified herein.

B. Excavate all materials encountered to depth indicated or specified; comply with safety rules of the state and federal governments.

C. Pile excavated material suitable for backfill in an orderly manner sufficient distance back from edge of excavation to avoid slides or cave-ins; 2' minimum clear distance.

D. Remove excavated material not suitable for backfill; waste at disposal area approved by Engineer; removal is incidental to construction.

E. Where new work crosses existing utilities or utility services, excavate in advance of pipe laying; determine crossing arrangement including exact construction line and grade.

F. Storm Sewer:

1. Class R-2 pipe embedment per SUDAS detail 3010.102 is required for all RCP storm sewer pipes within roadway right-of-way, including pipes beneath pavement.

G. Class F-3 pipe embedment per SUDAS detail 3010.103 is required for all sanitary sewers.

H. Compact backfill with pneumatic or mechanical tampers adjacent to or within 12" over pipe. Rollers or vibrating plate compactors may be used after sufficient backfill has been placed to assure that such equipment will not damage or disturb the pipe.

21. STORM SEWERS AND STRUCTURES

A. Comply with IOWA DOT STANDARD SPECIFICATIONS, except as modified herein.

B. Subdrain: corrugated pipe; corrugated exterior, smooth interior, corrugated PVC or corrugated PE as per Section 4040, 2.02. Subdrain pipe shall be slotted.

C. Backfill with porous backfill or subdrain and granular material for pipe bedding.

22. FIXTURE ADJUSTMENT

A. Adjust existing manholes as indicated on the construction drawings to finished grade in accordance with the Urban Standard Specifications. Adjustments include providing new castings, adjusting rings, and performing a chimney seal.

B. Adjust existing valve boxes to finished grade in accordance with the Urban Standard Specifications. Utilize the existing valve boxes, or install new valve boxes provided by the City. This work is incidental to construction.

C. Locate the existing water curb stop boxes for the residences along the proposed construction and adjust to finished grade as necessary. This work is incidental to construction.

23. RESTROOM BUILDING

A. See Sheets C600 series for Romtec kit style restroom building information and specifications. Procedures outlined herein are not intended to fully cover all bidding instruction and procedures, but are offered as an aid to the Contractor in their review of the construction documents.

B. The Contractor is responsible for ordering the building kit and utilizing the materials and components included in the building kit to construct a fully-functioning restroom facility.

C. The building contractor is to provide all labor, equipment and required materials to complete the construction of the building per the construction plans and manufacturer specifications.

D. The building contractor is to construct the building to meet all manufacturer specifications, requirements and recommendations.

E. The building contractor is responsible for securing and paying for all required permits and special inspections required by the City of Marshalltown.

F. Scope of supply and design submittal (construction documents).

1. The building materials are supplied as a kit for assembly and construction by a qualified building contractor.

2. The building package will be purchased and ordered by the Contractor, and will be delivered to the site by Romtec. The Contractor will be

required to receive, unload, and protect the building kit components and materials from theft and damage once received on site. Information regarding the specific components included in the building kit package is detailed in the construction documents.

3. Utility services - The Contractor is required to locate and connect all utilities necessary for operation of the building systems.

4. Warranty - Romtec provides a limited warranty for the building kit components. The Contractor is to meet all manufacturer requirements to qualify the building installation for the manufacturer's warranty.

5. Service exclusions - The Contractor is to provide any services not included that would be required for the construction and full operation of the restroom building.

6. See attached Romtec design options sheet for additional building options. These options are to be included in the pricing of the restroom building.

END OF SECTION

ROMTEC

DESIGN OPTIONS
Single-User Restroom

Date: 10.118.24

Project Name: Ann C Keyser Trailhead

Contact Name:

EXTERIOR

Exterior Siding Options:

- ○ Mortar Joint Split-Face Block
- ○ Mortar Joint Ground-Face Block
- ○ Cedar Board & Batt Siding
- ● Cedar Lap Siding
- ○ Manufactured Stone Siding
- ○ Other: _____
- ○ Dry Stack Split-Face Block
- ○ Fiber Cement Board & Batt Siding
- ○ Fiber Cement Lap Siding
- ○ Stucco Siding
- ○ Natural Stone Siding

Wainscot Options:

- ● NONE
- ○ Cedar Lap Siding Wainscot
- ○ Nautural Stone Siding Wainscot
- ○ Fiber Cement Lap Siding Wainscot
- ○ Manufactured Stone Siding Wainscot
- ○ Other: _____

Roof System Options:

- ○ Glulam Beams w/ Tongue & Groove Decking
- ○ Truss Roof System (Boxed Soffits)
- ○ Other: _____
- ● Truss Roof System
- ○ Insulated/Vaulted Roof System

Roofing Options:

- ○ Architectural Composition Roofing
- ● Standing Seam Metal Roofing (Concealed Fasteners)
- ○ Spanish Tile Roofing
- ○ Metal Roofing (Exposed Fasteners)
- ○ Cedar Shake Roofing
- ○ Other: _____

Roof Extension Options:

- ○ NONE
- ○ Timber Truss Roof Extension
- ○ Steel Truss Roof Extension
- ○ Other: _____
- ● Cantilever Roof Extension
- ○ Log Truss Roof Extension
- ○ Shed Roof for Covered Entry

Skylight Options:

- ● NONE
- ○ 15” x 46” Deck Mount Skylight
- ○ Other: _____
- ○ 24” x 24” Deck Mount Skylight
- ○ 10” Solar Tube Skylight (Truss Roof Only)

Doors & Frames Options:

- ○ 18ga Honeycomb-Core Steel Door w/ 16ga Frames
- ○ Other: _____
- ● 16ga Honeycomb-Core Steel Door w/ 14ga Frames (Hurricane Rated)
- ○ FRP Door and Frame

Door Finish Options:

- ○ Painted (Black)
- ● Powder Coated (Black)
- ○ Other: _____
- ○ Painted (Custom):
- ○ Powder Coated (Custom):

Door Accessory Options:

- ● Heavy-Duty Door Closer
- ● Pull/Pull Handle w/ Deadbolt Locks
- ● Interconnected Lever Locks w/ Occupancy Indicator
- ○ Keypad Locks
- ● Threshold
- ○ Other: _____
- ○ Hurricane-Rated Door Closer
- ○ Lever Locks
- ○ Magnetic Locks w/ Programmable Timer
- ● Kickplate
- ● Sweep

Other Exterior Options:

- ○ NONE
- ○ Other: _____
- ● Anti-Graffiti Exterior Coating

INTERIOR

Interior Finish Wall Options:

- ● Latex Epoxy Paint Over Block
- ○ Faux Tile FRP
- ○ Drywall
- ○ Smooth FRP
- ○ Tile
- ○ Other: _____

Interior Finish Floors Options:

- ● Sealed Concrete
- ○ Epoxy Floor Coating
- ○ Other: _____
- ○ Latex Epoxy Paint
- ○ Tile

Dispenser/Accessory Options

- ○ NONE
- ● Three Roll Dispenser (Stainless Steel, Wall Mount)
- ○ Paper Towel Dispensers (Stainless Steel, Wall Mount)
- ○ Sanitary Napkin Receptacle (Stainless Steel, Wall Mount)
- ○ Diaper Deck (Plastic, Wall Mount w/ Stainless Steel Veneer)
- ○ Two Roll Dispenser (Stainless Steel, Wall Mount)
- ○ Seat Cover Dispensers (Stainless Steel, Wall Mount)
- ○ Child Protection Seat (Plastic, Wall Mount)
- ○ Polished Stainless Steel Mirror
- ○ Glass Mirror w/ Stainless Steel Trim
- ○ Stainless Steel Trashcan
- ○ Diaper Deck (Plastic, Wall Mount)
- ○ Soap Dispensers (Stainless Steel, Wall Mount)
- ○ Other: _____

PLUMBING

Fixture Finish Options:

- ● China
- ○ Stainless Steel

Toilet Mounting Location Options:

- ● Floor Mount
- ○ Wall Mount

Flush Valve Options:

- ○ Manual Lever, Chrome & Dual Flush Valve (High & Low Flow)
- ○ Concealed, Hydraulic Valve
- ○ Exposed, Sensor Valve
- ○ Other: _____
- ● Low Flow (works with any of the above options)
- ○ Manual Lever, Chrome Flush Valve
- ○ Concealed, Sensor Valve

Faucet Options:

- ○ Lever Handle Faucet
- ● Metered Push-Button Faucet
- ○ Motion Sensor Faucet (Battery Operated)
- ○ Motion Sensor Faucet (Hard-Wired)
- ○ Low Flow (works with any of the above options)
- ○ Other: _____

Utility Sink Options:

- ● NONE
- ○ 17" Utility Sink & Faucet (Waist Level)
- ○ 24" by 24" Mop Sink, Faucet, Holder & Guard (Floor Level)
- ○ Other: _____

Water Heater Options:

- ● NONE
- ○ Tank Water Heater (Electric)
- ○ Tank Water Heater (Gas)
- ○ Tankless Water Heater (Electric)
- ○ Tankless Water Heater (Gas)
- ○ Other: _____

Drinking Fountain (Hi/Lo) Options:

- ○ NONE
- ○ Stainless Steel Drinking Fountain
- ● Stainless Steel Drinking Fountain w/ Bottle Filler
- ○ Refrigerated Option
- ○ Freeze Protection Option
- ○ Other: _____

ELECTRICAL

Light - External Options:

- ● Wall Mount LED Downlight (Meets "Dark Sky" Requirements
- ○ Wall Mount LED
- ○ Wall Mount LED Vandal Resistant
- ○ Other: _____

Exterior - Light Control Options:

- ● Photocell
- ○ Timer

Light - Internal Options:

- ● 48" LED Light
- ○ 48" Vapor Tight LED Light
- ○ Wall Mount LED
- ○ Recessed LED Canned Lights
- ○ Other: _____

Interior - Light Control Options:

- ○ Switches
- ● Motion Sensor
- ○ Timer

Breaker Panel Options:

- ○ 100 Amp, 1-Phase Breaker Panel
- ● 200 Amp, 1-Phase Breaker Panel
- ○ Other: _____

Hand Dryer Options:

- ○ NONE
- ● Cast Iron White Wall Mount Hand Dryer
- ○ Stainless Steel Wall Mount Hand Dryer
- ○ Fast Air Thru-Wall Hand Dryer
- ○ Other: _____

OTHER FEATURES

Room Ventilation Options:

- ○ Mechanical Exhaust System
- ● Natural Ventilation

Heating Options:

- ● NONE
- ○ Wall Heater
- ○ Other:
- ○ Thru Wall Heating/Cooling Unit (Individual Room)
- ○ Ductless Heating/Cooling System (multi-indoor unit)

Wall Insulation Options:

- ● NONE
- ○ Interior Wall Insulation (Requires Interior Wall Finish)
- ○ Exterior Wall Insulation (Requires Siding Package)

Optional Features:

- ● Seasonal Facility (Closed Winter Months)
- ○ Grid-Tied Solar System
- ○ Coastal Upgrade Package
- ○ Hurricane Rated
- ○ Flood Zone (Water-Tight)
- ○ Other:
- ○ Open Year-Round
- ○ Off-Grid Solar System
- ○ Eco-Friendly Package
- ○ Tornado Safe Room
- ○ Flood Zone (Passive)

CLEAR FORM

RESET ALL FORM FIELDS

SUBMIT

CLICK HERE TO SEND FROM EMAIL

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Basic Requirements
   2. Detailed Requirements
   3. Facilitation of New Services
   4. Coordination
   5. Quality Assurance
   6. Codes, Ordinances, & Permits
   7. Common requirements for electrical installation
   8. Excavating & Backfilling
   9. Painting
   10. Cleaning & Rubbish

1.03 SUBMITTALS

A. Shop Drawings:
   1. Submit shop drawings, wiring diagrams, and descriptive literature on all equipment furnished in this contract. Contractor shall “approve” shop drawings as specified in Division 1 prior to submitting to Engineer for approval. Shop drawing submittals shall comply with Division 1 requirements.
   2. Make submittals as soon as practicable after the signing of the contract. Shipment shall not be released until drawings and literature have been finally approved.
   3. Shop drawings shall be checked by the Contractor for shape, dimensions, and details of attachment to the construction before submittal. Submitted shop drawings will be presumed to have been so checked by the Contractor.
   4. The literature shall be complete, giving materials, gauges, weights, finishes, etc., and in case of lighting fixtures, shall include ETL photometric curves.
   5. Number of copies required is the number of copies the Contractor desires returned, or the quantity listed in Division 1, whichever is greater.
   6. Wiring diagrams shall be furnished for all communication and control systems under this contract.
   7. In addition to the foregoing, the Contractor is to supply to the General Contractor, for delivery to the Owner, bound in a single set, a complete shop drawing portfolio of all equipment indicated under the specific specification section. Submit these near completion of the project arranged and indexed according to the CSI format.

B. Test reports: Submit written installation test reports for review and approval immediately after testing has been satisfactorily completed.

C. Acceptance certificates: Submit written manufacturer, testing agency and/or local Code authority acceptance certificates with project closeout documentation.

D. Warranty: Submit a written warranty statement detailing all system and equipment warranties. Warranty shall be signed by Submittals are not required for this Section.

E. Operation & Maintenance Instructions:
   1. Refer to Division 1 for submittal and training requirements.
   2. Furnish approved operation and maintenance instruction booklets covering each listed item of equipment installed under this contract. These booklets shall provide complete instructions on the proper operation, use and periodic maintenance, together with the

source of replacement parts and service for the item of equipment covered.

3. Operation and maintenance manuals shall include copies of test reports, acceptance certificates and warranty information.
4. In addition to the foregoing, the Contractor shall demonstrate to the Owner's designated personnel the use of the systems listed herein and shall furnish three (3) typewritten copies of a general operation procedure. Include locations and functions of switches, circuit breakers, fuses, etc.
5. After final acceptance of all work and occupancy of the building, the Contractor shall have on the job, a qualified representative to make final adjustments of electrical systems and to instruct the Owner's representative in operating procedures, adjustment, and maintenance of system components, and to acquaint the Owner's representative with locations and functions of circuit breakers, fuses, switches, control devices, etc.

F. Record Drawings:
1. Refer to Division 1 for submittal requirements.
2. The Architect/Engineer will furnish one (1) set of blue line prints of the building floor plan for the Contractor's use in making a record layout of actual locations of equipment, devices, routing of conduits and locations of pull boxes for the following facilities:
   a. Electrical feeders to substations and branch circuit panels
   b. All branch circuit wiring
   c. Voice/data conduit system
   d. Empty conduits for use by others
3. The information shall be neatly marked and the prints delivered to the Architect.

G. Contractor's Warranty:
1. All work shall be warranted to be free of defects and to function properly for one year from the date of final acceptance or beneficial occupancy, whichever shall occur first. Defects appearing within the warranty period shall be repaired to the satisfaction of the Architect/Engineer. Refer to Division 1 for additional requirements.
2. The warranty shall not obligate the Contractor for failure resulting from accident or from improper operation or care on the part of the Owner.
3. Warranty for drivers and LEDs shall be as follows: Warranty failure shall be deemed to have occurred when 10% or more of the population of drivers or LED boards have failed. Should this occur, it is necessary that the Owner (or Contractor prior to substantial completion) make timely notification of the Architect/Engineer to facilitate a warranty claim with the manufacturer(s). Any extended warranties offered by Manufacturers shall not be preempted by this warranty.

1.04 BASIC REQUIREMENTS

A. Before bidding, the Contractor shall diligently study and compare all contract documents and shall be signed by the warranty holder and promptly report to the Architect/Engineer any discrepancies or deficiencies discovered by or made known to the Contractor.

B. Extended warranties and manufacturer based warranties shall be signed by the warranty holder.

C. Discrepancies: Whenever a discrepancy or inconsistency exists between related information indicated on the contract drawings and/or specifications (such as differences between product descriptions and catalog numbers) this contractor shall obtain additional clarification and direction from the Architect/Engineer before proceeding. For bidding purposes, this contractor shall include warranty terms the labor and materials necessary to comply with the alternative that results in the greatest cost to the Contract.

D. Deficiencies: The Contractor and subcontractors shall resolve all known deficiencies and inadvertent omissions, including non-compliance with applicable codes, with the Architect/Engineer prior to ordering materials or proceeding with the work. Any work performed prior to receipt of instruction from the Architect/Engineer will be done so at the Contractor’s risk.

E. Manufacturer's Catalog Numbers: Product series, model, or catalog numbers, whether indicated on drawings or specifications, shall not be considered complete. This Contractor shall not order any product based solely upon the stated catalog number. Furnish products including accessories and options necessary to match the full product description and its intended purpose and application based on all information available from the contract documents.

1.05 DETAILED REQUIREMENTS

A. Equipment and material specifications are minimum general requirements.

B. In cases where construction requirements and/or special features not mentioned are stated in subsequent sections, on the drawings, or by local Code, the higher standard shall apply.

C. Coordinate rough-in work and other electrical provisions for temperature sensors, CO2 sensors, humidistats, thermostats, and other wall-mounted BMS wired devices shown on the mechanical drawings. Refer to the mechanical plans and the mechanical symbols list to identify such items. Install a junction box with a plaster ring with pathway to equipment, unless otherwise indicated on mechanical drawings or specifications. Coordinate exact requirements with the contractor providing the wired device.

D. Electrical installations shall not hinder the regular maintenance of or replacement of mechanical equipment. Conduit and cabling shall not be installed beneath suspended mechanical units. Coordinate and plan installations.

1.06 FACILITATION OF NEW UTILITY SERVICES

A. Stake all necessary lot lines, lot corners, and building footprints prior to commencement of installations associated with new utility services. Locate and stake all underground facilities such as storm and sanitary sewer, water lines, irrigation systems, underground electric, underground communications, grease traps, mechanical/piping systems, etc. All locates and information from site surveys shall be made available at no cost to each utility company that is providing new and/or relocated services.

1.07 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:
   1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
   2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
   3. To allow right of way for piping and conduit installed at required slope.
   4. So connecting raceways, cables, and wireways will be clear of obstructions and of the working and access space of other equipment.

B. Prior to bidding, this contractor shall determine conduit and cabling routings, including the means and methods of installation, maximum feeder/branch-circuit lengths, pull boxes, junction boxes, conduit bodies, fittings, and any other related work in accordance with the contract documents and the applicable building codes.

C. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

D. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."

1.08 QUALITY ASSURANCE

A. Test Equipment Suitability and Calibration: Comply with NETA ATS, "Suitability of Test Equipment" and "Test Instrument Calibration."

B. Tests & Adjustments
   1. Contractor shall perform at his own expense, except for electrical energy, any tests that the Architect/Engineer may order to prove the performance of any device(s) and/or equipment supplied under this contract.

2. Such tests will be limited to non-destructive test and will involve only direct reading(s) of the parameter(s) involved, i.e., actual trip rating or time delay of a circuit breaker may be required but coordination study is beyond the scope of this requirement.
3. Provide adjustments such as branch circuit re-arranging, circuit breaker trip settings, final selection of fuse sizes, motor starter overload element settings, and the like that may be indicated by the tests and/or to suit equipment to be installed.

1.09 CODES, ORDINANCES, & PERMITS

A. All governmental codes and ordinances that are applicable and in effect at the time and location of this work are hereby referenced as an integral part of the specification to establish minimum standards of design detail, materials, and workmanship. Extra payment will not be allowed for work or changes required by local code enforcement authorities and/or utility companies. This is not to preclude the establishment of non-conflicting higher standards as may be specified herein and/or indicated on the drawings. In case of conflict between any of the standards established herein and a governmental code or ordinance, refer to the Architect/Engineer and obtain instructions before proceeding with the work involved.

B. Apply for, obtain, and pay for required permits and certificates of inspection

C. Particular attention is directed to:
1. National Electrical Code
2. Local electric wiring ordinances
3. Requirements of the electric utility company
4. IEEE standards association

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In all Division 26 Part 2 articles where titles introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified or prior approved product substitution. No product manufacturer will be accepted after this bid unless approved through a contractual change or written acceptance by Engineer. See “Substitutions” article herein.

2.02 PROPRIETARY REFERENCES

A. Except where there is indication to the contrary, the intent of this specification is to be open to all brand names and suppliers that offer equipment that complies with the stated requirements of capacity, function, quality configuration, size, shape, and operating characteristics that are compatible with the design objectives of the system and interfacing equipment.

B. Stated requirements are minimum in the case of unit output and maximum in the case of input requirements.

C. The perceived operational limitations and maintenance requirements as well as the availability of suitable maintenance support will be evaluated in comparison to competing equipment as an important factor in deciding if an item of equipment is acceptable or not acceptable.

D. The product manufacturers listed are manufacturers that are believed to be producers of like equipment or materials and locally represented, with service capability and otherwise meeting the requirements of the contract documents. Reference to a brand name is not to be construed as a representation that the named supplier actually has available the equipment or materials that meet the detailed requirements of the contract documents.

E. Details of construction, control, or operation that are proprietary and not significant to the Owner's utilization of the equipment will not be used as a basis for qualifying or disqualifying any equipment.

2.03 SUBSTITUTIONS

A. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed

substitution.

B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Engineer at least 10 days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the work including changes in the work of other contracts that incorporation of the proposed substitution would require shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Engineer's decision of approval or disapproval of a proposed substitution shall be final. Refer to Division 1 for additional requirements.

C. If the Engineer approves a proposed substitution prior to receipt of bids, such approval will be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner.

D. No substitutions will be considered after the contract award unless specifically provided in the contract documents.

2.04 UL LABEL

A. All materials, devices, etc. installed under this contract shall bear the UL label, or be UL listed as applicable except those specified items not covered by existing UL Standards.

PART 3 EXECUTION

3.01 BUILDING CONSTRUCTION

A. Refer to the general construction drawings, which are bound with the drawings of this work, for construction details, elevations, etc.

3.02 INSPECTION OF SITE

A. Determine information regarding existing construction by the site inspection prior to bidding.

B. By submitting a bid for this work, contractor agrees he has inspected the existing site and familiarized himself with existing conditions and how they relate to the contract documents.

3.03 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Examine the site and all the drawings before proceeding with the layout and installation of this work. Verify all door swings and clearances to cabinets, etc. before locating switch and outlet boxes. Locate conduits, boxes, etc., essentially as shown on the drawings, but in exact layout determined on the job to suit actual conditions. Locate work so it does not interfere with access to service for any equipment. Confer and cooperate with other trades on the job so all parts will be installed in proper relationship. Precise location of parts to coordinate with other work is the responsibility of the Contractor.

B. Obtain and follow manufacturer's installation instructions in the installation of all electrical equipment. Observe all restrictions imposed by the equipment manufacturer, UL label, NEC, or other applicable code in regard to setting; anchoring; hanging; clearances; electric, magnetic or thermal separation; shielding; weather and moisture protection. In case of conflict between the specifications herein and instructions or code governing the installation, notify the Architect/Engineer and receive his instructions before proceeding.

C. Arrange exposed work as closely as practicable to wall or ceiling surfaces and in accurate alignment with exposed features of structure and/or trim. Locate concealed work so fittings, connectors, and other projections will clear surfaces. Where the option of more than one material is given, selection shall be confined to those which may be properly installed.

D. Install all work in a neat and workmanlike manner by workmen thoroughly qualified in the trade or duties they are to perform. Rough work will be rejected.

E. The Contractor is responsible for correct size and location of chases, slots, and openings require and will be liable for any cutting or patching made necessary by his failure to make proper arrangements in this respect.

F. Maintain a competent full-time superintendent on the job to oversee and coordinate work with other trades, receive instructions from the Architect/Engineer, make layout of work to suit actual conditions, and to satisfy requirements of the drawings, specifications, and good workmanship.

3.04 EXCAVATING & BACKFILLING

A. Provide excavating and backfilling necessary for installation of this work.

B. Dig trenches to proper depth, graded for fall and to give solid bearing for each length of conduit or wire. Underground conduit or wire shall not be covered until inspected and the installation approved.

C. Trenches under the building and under concrete slabs around the building shall be backfilled with mechanically tamped sand to level with surrounding earth. Dirt backfill shall not be used for these trenches.

D. Before starting any excavation, use every reasonable means (examination of drawings, check with local utility companies and completed site work, local inquiry and check of surface indications) to determine the presence of underground piping, wiring, etc. in the area to be excavated. If such are, or are suspected to be existing, obtain instructions from the Architect/Engineer before proceeding.

E. Refer to Division 31 for additional excavating, trenching and backfilling requirements.

F. Contractor shall verify, smooth or refill and reseed any settlement areas or mounded areas of trenching after one winter.

3.05 PAINTING

A. Exposed electrical work in unfinished areas will require painting unless noted otherwise.

B. Protect the manufacturer's finish on equipment that is so finished. Clean and/or touch-up as necessary to repair damage at the end of the job.

C. Paint exposed work installed under this contract with suitable primer and two coats of approved enamel, colors as specified or directed.

D. Protect the manufacturer's finish on equipment that is so finished. Clean and/or touch-up as necessary to repair damage at the end of the job.

3.06 CLEANING & RUBBISH

A. During the work, keep the premises clear of unnecessary accumulation of debris.

B. Plug or cap open ends of conduits to prevent the entrance of dirt and/or moisture during construction. Protect boxes, panel enclosures, etc. against the entrance of mortar, plaster, moisture, and other foreign material during construction, and thoroughly clean these spaces before pulling wires, and again, if necessary, before installing covers of fronts.

C. On completion of the work, remove all rubbish and debris resulting from the work or the work of subcontractors and dispose of same.

D. All equipment, fixtures, etc. shall be thoroughly cleaned of accumulated dust, plaster, or other dirt and left in a satisfactory condition for use.

END OF SECTION

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single conductor building wire

B. Wiring connectors

C. Electrical tape

D. Oxide inhibiting compound

E. Wire pulling lubricant

F. Cable ties

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 07 84 00 - Firestopping.

C. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2018).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011 (Reapproved 2017).

C. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).

D. ASTM B800 - Standard Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes - Annealed and Intermediate Tempers; 2005 (Reapproved 2015).

E. ASTM B801 - Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy Wire for Subsequent Covering of Insulation; 2018.

F. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.

G. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

H. NECA 104 - Recommended Practice for Installing Aluminum Building Wire and Cable; 2012.

I. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2009.

J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

L. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

M. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

N. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

O. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

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 with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
   3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 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.

2.02 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/ICEA S-95-658.

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 05 26.

H. Conductor Material:
   1. Provide copper conductors except where aluminum conductors are specifically indicated or permitted for substitution. Conductor sizes indicated are based on copper unless specifically indicated as aluminum. Conductors designated with the abbreviation "AL" indicate aluminum.
      a. Substitution of aluminum conductors for copper is permitted only for the following:
         1) Feeders: Copper conductors size #4 AWG and larger.
      b. Where aluminum conductors are substituted for copper, comply with the following:
         1) Size aluminum conductors to provide, when compared to copper sizes indicated, equivalent or greater ampacity and equivalent or less voltage drop.
         2) Increase size of raceways, boxes, wiring gutters, enclosures, etc. as required to accommodate aluminum conductors.
   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. Aluminum Conductors (only where specifically indicated or permitted for substitution): AA-8000 series aluminum alloy conductors recognized by ASTM B800 and compact stranded in accordance with ASTM B801 unless otherwise indicated.

I. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:
         1) 20A, 120 V circuit longer than 100 ft: 10 AWG. for voltage drop.

J. 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-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
   1. Feeders and Branch Circuits:
      a. Size 10 AWG and Smaller: Solid.
      b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2.
   2. Aluminum Building Wire (only where specifically indicated or permitted for substitution): Type XHHW-2.

2.04 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.

2.05 ACCESSORIES

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Electrical Tape:
   1. 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.

C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.

D. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

E. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.01 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. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
   5. 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. Install aluminum conductors in accordance with NECA 104.

E. 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.

F. Exposed Cable Installation (only where specifically permitted):
1. Route cables parallel or perpendicular to building structural members and surfaces.
2. Protect cables from physical damage.

G. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

H. Support cables according to Section 260529 - Hangers and Supports for Electrical Systems.

I. Install conductors with a minimum of 6-inches of slack at each outlet.

J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

K. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

L. 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. Connections for Aluminum Conductors: Fill connectors with oxide inhibiting compound where not pre-filled by manufacturer.

M. 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.

N. Insulate ends of spare conductors using vinyl insulating electrical tape.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

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.

END OF SECTION

SECTION 26 05 26
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 bars.

E. Ground rod electrodes.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding.

C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.04 QUALITY ASSURANCE

A. Comply with requirements of NFPA 70.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. 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.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.

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. Concrete-Encased Electrode(For new service installation):
   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.
3. Ground Ring(For new service installation):
   a. Provide a ground ring encircling the building or structure consisting of bare copper conductor not less than 2 AWG in direct contact with earth, installed at a depth of not less than 30 inches.
4. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.

F. Service-Supplied System Grounding:
   1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
   2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.

G. 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.

H. Separately Derived System Grounding:
   1. Separately derived systems include, but are not limited to:
      a. Transformers (except autotransformers such as buck-boost transformers).
      b. Uninterruptible power supplies (UPS), when configured as separately derived systems.
      c. Generators, when neutral is switched in the transfer switch.
   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. 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.
   5. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

I. 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.
7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
   a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
   b. Metal gas piping.

J. Communications Systems Grounding and Bonding:
1. Provide bonding jumper in raceway from building grounding electrode system to each communications room or backboard and provide ground bar for termination.
   a. Bonding Jumper Size: As indicated.
   b. Raceway Size: 3/4 inch trade size unless otherwise indicated or required.
   c. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.
   d. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

K. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

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 05 26:
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).
   b. Where bare copper conductors are used for grounding systems, they shall comply with the following:
      1) Solid Conductors: ASTM B 3.
      2) Stranded Conductors: ASTM B 8.
      3) Tinend Conductors: ASTM B 33.
      4) Bonding Cable: 28 KCMIL, 14 strands of No. 17 AWG conductors, 1/4 inch in diameter.
      5) Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
      6) Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
      7) Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

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. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
   3. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
   4. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

D. Ground Bars:
   1. Description: Copper rectangular ground bars with mounting brackets and insulators.
   2. Size: As indicated.
   3. Holes for Connections: As indicated or as required for connections to be made.

E. Grounding Bus:
   1. Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
   3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.

G. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.

H. 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.
      a. Applications:
         1) Underground connections(except at test wells and as otherwise indicated.
         2) Connections to structural steel.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
      a. Applications:
         1) Pipe and equipment grounding conductor terminations.

I. Identify grounding and bonding system components in accordance with Section 26 05 53.

3.02 EQUIPMENT GROUNDING:

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

3.03 GROUNDING AT THE SERVICE:

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Tests and Inspection: After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
   1. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions
   2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Make tests at ground rods before any conductors are connected.
      a. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
      b. Perform tests by fall-of-potential method according to IEEE 81.
   3. Prepare dimensioned drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
      a. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.
   4. Prepare test and inspection reports. Report measured ground resistances that exceed the following values:
      a. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
      b. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
   5. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

6. Grounding system will be considered defective if it does not pass tests and inspections.

END OF SECTION

SECTION 26 05 29
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. Construction requirements for concrete bases

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete equipment pads.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. The use of zip ties is not allowed for this purpose.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Comply with MFMA-4.
   2. Channel Material:
      a. galvanized steel.
   3. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete: Use preset concrete inserts.
   3. Solid or Grout-Filled Masonry: Use expansion anchors.
   4. Hollow Masonry: Use toggle bolts.
   5. Hollow Stud Walls: Use toggle bolts.
   6. Steel: Use beam clamps complying with MSS SP-96.
   7. Sheet Metal: Use sheet metal screws.
   8. Wood: Use Fasten with lag screws or through bolts.

9. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
    a. Comply with MFMA-4.
    b. Channel Material: Use galvanized steel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Do not provide support from piping, ductwork, or other systems.

D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.

E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.

F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

G. Equipment Support and Attachment:
    1. Strength and support assemblies: where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
    2. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
    3. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
    4. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
    5. Use slotted-channel racks attached to substrate to support equipment surface-mounted on hollow stud wallsand nonstructual building surfaces.
    6. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
    7. Unless otherwise indicated, mount floor-mounted equipment on properly sized 3 inch high concrete pad constructed in accordance with Section 03 30 00 and as specified in this section.
    8. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
    9. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.
    10. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

H. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.

I. Secure fasteners according to manufacturer's recommended torque settings.

J. Remove temporary supports.

3.02 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."

C. Anchor equipment to concrete base as follows:
   1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install anchor bolts to elevations required for proper attachment to supported equipment.
   3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

END OF SECTION

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SECTION 26 05 33.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Intermediate metal conduit (IMC).

C. Flexible metal conduit (FMC).

D. Liquidtight flexible metal conduit (LFMC).

E. Electrical metallic tubing (EMT).

F. Rigid polyvinyl chloride (PVC) conduit.

G. Surface Mounted Raceways

H. Conduit fittings.

I. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete encasement of conduits.

B. Section 07 84 00 - Firestopping.

C. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.

D. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
   1. Includes additional requirements for fittings for grounding and bonding.

E. Section 26 05 29 - Hangers and Supports for Electrical Systems.

F. Section 26 05 33.16 - Boxes for Electrical Systems.

G. Section 26 05 33.23 - Surface Raceways for Electrical Systems.

H. Section 26 05 39 - Underfloor Raceways for Electrical Systems.

I. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

J. Section 26 21 00 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conduits.

K. Section 31 23 16 - Excavation.

L. Section 31 23 23 - Fill: Bedding and backfilling.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a 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. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.

D. Concealed Within Masonry Walls: Use electrical metallic tubing (EMT).

E. Concealed Within Hollow Stud Walls: Use electrical metallic tubing (EMT).

F. Concealed Above Accessible Ceilings: Use electrical metallic tubing (EMT).

G. Interior, Damp or Wet Locations: Use intermediate metal conduit (IMC).

H. Exposed, interior, Located within finished spaces: Use Decorative Surface Mounted Raceway

I. Exposed, Interior, Not Subject to Physical Damage, Located within unfinished spaces(mechanical rooms/storage rooms): Use electrical metallic tubing (EMT).

J. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

K. Exposed, Exterior: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

L. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

M. Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit.
   2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
   3. Maximum Length: 6 feet unless otherwise indicated.
   4. Vibrating equipment includes, but is not limited to:
      a. Transformers.
      b. Motors.
      c. Pneumatic Equipment
      d. Electric Solenoids.
      e. Hydraulic equipment.

N. Fished in Existing Walls, Where Necessary: Use flexible metal conduit.

2.02 CONDUIT REQUIREMENTS

A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. 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. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 FLEXIBLE METAL CONDUIT (FMC)

A. 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 to be used.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel.

2.06 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel.

2.07 ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel.
   3. Connectors and Couplings: Use compression (gland) or set-screw type.
      a. Do not use indenter type connectors and couplings.

2.08 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. 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.

B. 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.

2.09 SURFACE MOUNTED RACEWAYS

A. Provide all components, fittings, supports, and accessories required for a complete raceway system.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Do not use raceways for applications other than as permitted by NFPA 70 and product listing.

D. Surface Metal Raceways: Listed and labeled as complying with UL 5.

E. Surface Nonmetallic Raceways: Listed and labeled as complying with UL 5A.

F. Multioutlet Assemblies: Listed and labeled as complying with UL 111.
   1. Color: To be selected by architect prior to product order.
   2. Accessory Device Boxes: Suitable for the devices to be installed; color to match raceway.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install intermediate metal conduit (IMC) in accordance with NECA 101.

E. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

G. Conduit Routing:
   1. Unless dimensioned, conduit routing indicated is diagrammatic.
   2. When conduit destination is indicated without specific routing, determine exact routing required.
   3. Conceal all conduits unless specifically indicated to be exposed.
   4. Install raceways square to enclosures and terminate with locknuts.
   5. 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.
   6. Unless otherwise approved, do not route conduits exposed:
      a. Across floors.
      b. Across roofs.
      c. Across top of parapet walls.
      d. Across building exterior surfaces.
   7. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
   8. Arrange conduit to maintain adequate headroom, clearances, and access.
   9. Arrange conduit to provide no more than the equivalent of three 90 degree bends between pull points.
   10. Arrange conduit to provide no more than 150 feet between pull points.
   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. This includes, but is not limited to:
      a. Heaters.
      b. Hot water piping.
      c. Flues.
   13. arrange stub-ups so curved portions of bends are not visible above finished slab.

H. Conduit Support:
   1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
   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. Support conduits within 12 inches of connected enclosure.

I. Connections and Terminations:
   1. Use approved 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 for dry locations and raintight hubs for wet locations.

6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.
8. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

J. 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. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
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, using materials and methods specified in Section 07 84 00.

K. Underground Installation:
1. Provide trenching and backfilling in accordance with Section 31 23 16 and Section 31 23 23.
2. Provide underground warning tape in accordance with Section 26 05 53 along entire conduit length.
3. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
   a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
   b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

L. 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.

M. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
3. Where conduits penetrate coolers or freezers.

N. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

O. Provide grounding and bonding in accordance with Section 26 05 26.

P. Surface Raceway Installation:
   1. Install surface raceway with a minimum 2-inch radius control at bend points.
   2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section.
   3. Support raceway according to manufacturers written instructions. Tape and glue are not acceptable support methods.

END OF SECTION

SECTION 26 05 33.16
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. Underground boxes/enclosures.

1.02 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. SCTE 77 - Specifications for Underground Enclosure Integrity; 2017.

H. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

I. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

J. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

K. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

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 aluminum 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. 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size
13. Wall Plates: Comply with Section 26 27 26.

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. Outdoor Locations: Type 4 Stainless Steel.
    b. Wet or Damp locations: Type 4 Stainless Steel.
3. Junction and Pull Boxes Larger Than 100 cubic inches:
    a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
    a. Provide lockable hinged covers, all locks keyed same as panelboards unless otherwise indicated.
    b. Back Panels: Painted steel, removable.
5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.

D. 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: 12 inches by 24 inches unless otherwise indicated.
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. Cover Finish: Nonskid finish shall have minimum coeficcient of friction of .50.
6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
7. 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. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
8. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
    a. Manufacturers:
        1) Hubbell Incorporated; Quazite Products; _____: www.hubbellpowersystems.com/#sle.
        2) MacLean Highline; _____: www.macleanhighline.com/#sle.
        3) Oldcastle Precast, Inc; _____: www.oldcastleprecast.com/#sle.
        4) Armorcast Poducts Company.
        5) Carson Industries LLC.
        6) _____.

PART 3 EXECUTION

3.01 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. Provide separate boxes for emergency power and normal power systems.

E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

H. Box Locations:
   1. Mount at heights indicated on drawings. If mounting heights are not individually indicated, Locate boxes to be accessible. Provide access panels in accordance with Section 08 31 00 as requiredwhere approved by the Architect.
   2. Unless dimensioned, box locations indicated are approximate.
   3. Locate boxes so that wall plates do not span different building finishes.
   4. Locate boxes so that wall plates do not cross masonry joints.
   5. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
   6. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
   7. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.

I. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
   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 grid or ceiling support system.
   4. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
   5. Do not support boses by conduit alone.

J. Install boxes plumb and level.

K. 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.

L. Install boxes as required to preserve insulation integrity.

M. Metallic Floor Boxes: Install box level at the proper elevation to be flush with finished floor.

N. Underground Boxes/Enclosures:

1. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
2. Unless otherwise indicated, install enclosure on gravel base, minimum 6 inches deep.Grade base from 1/2-inch sieve to No4 sieve and compact to same density as adjacent undisturbed earth.
3. Flush-mount enclosures located in concrete or paved areas.
4. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.
5. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.
6. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

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 05 26.

S. Identify boxes in accordance with Section 26 05 53.

END OF SECTION

SECTION 26 05 53
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. Voltage markers.

E. Underground warning tape.

F. Floor marking tape.

G. Warning signs and labels.

1.02 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2023.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2015.

E. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.

B. Identification for Equipment:
   1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components. Provide unique idenfication for all branch loads served.
      a. Panelboards:
         1) Use typewritten circuit directory in location provided by panelboard manufacturer to identify load(s) served for panelboards with a door.Identify spares and spaces.
         2) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
      b. Enclosed switches, circuit breakers, and motor controllers:
      c. Time Switches:
         1) Identify load(s) served and associated circuits controlled. Include location.
      d. Enclosed Contactors:
         1) Identify load(s) and associated circuits controlled. Include location.
   2. Service Equipment:
      a. Use identification nameplate to identify each service disconnecting means.
      b. For buildings or structures supplied by more than one service, or any combination of branch circuits, feeders, and services, use identification nameplate or means of identification acceptable to authority having jurisdiction at each service disconnecting means to identify all other services, feeders, and branch circuits supplying that building or structure. Verify format and descriptions with authority having jurisdiction.
   3. Emergency System Equipment:
      a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.

b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.

4. Use identification nameplate to identify switchboards and panelboards utilizing a high leg delta system in accordance with NFPA 70.
5. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
6. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".
7. Use floor marking tape to identify required equipment working clearanceswithin mechanical or electrical equipment rooms. Do not install within finished spaces..
8. 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. Service equipment.
9. Arc Flash Hazard Warning Labels: Use warning labels meeting the requirements of NFPA 70 to identify arc flash hazards.
   a. Minimum Size: 3.5 by 5 inches.
   b. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.
   c. Service Equipment: Include the following information in accordance with NFPA 70.
      1) Nominal system voltage.
      2) Available fault current.
      3) Clearing time of service overcurrent protective device(s).
      4) Date label applied.

C. Identification for Conductors and Cables:
1. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
   a. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.
      1) Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
      2) Colors for 208/120-V Circuits:
         (a) Phase A: Black.
         (b) Phase B: Red.
         (c) Phase C: Blue.
      3) Colors for 480/277-V Circuits:
         (a) Colors specified in first three subparagraphs below are generally used for phase conductors at this voltage.
         (b) Phase A: Brown.
         (c) Phase B: Orange.
         (d) Phase C: Yellow.
      4) Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
2. Identification for Communications Conductors and Cables: Comply with Section 27 10 00.
3. 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.

4. Use underground warning tape to identify direct buried cables.

D. Identification for Boxes:
1. Use voltage markers to identify highest voltage present.
2. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.
   a. For exposed boxes in public areas, use only identification labels.
3. Use warning labels to identify electrical hazards for boxes containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".

E. Identification for Devices:
1. Identification for Communications Devices: Comply with Section 27 10 00.
2. Wiring Device and Wallplate Finishes: Comply with Section 26 27 26.
3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.
   a. For receptacles in areas as directed by Architect, provide identification on inside surface of wallplate. Verify with Architect prior to label application.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
1. Materials:
   a. Indoor Clean, Dry Locations: Use plastic nameplates.
   b. Outdoor Locations: Use stainless steel or aluminum nameplates suitable for exterior use.
2. Plastic Nameplates: Two-layer or three-layer laminated electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
   a. Exception: Provide minimum thickness of 1/8 inch when any dimension is greater than 4 inches.
3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
5. 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. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
   a. Use only for indoor locations.
2. 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: 1.5 inches by 3 inches.
2. Legend:
   a. System designation where applicable:
      1) Emergency Power System: Identify with text "EMERGENCY".
      2) Fire Alarm System: Identify with text "FIRE ALARM".
   b. Equipment designation or other approved description.
   c. Other information as indicated.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height:
   a. System Designation: 1/2 inch.
   b. Equipment Designation: 1/2 inch.
   c. Other Information: 1/4 inch.
5. Color:

a. Normal Power System: White text on black background.

D. 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.

2.03 VOLTAGE MARKERS

A. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

B. Minimum Size:
1. Markers for Equipment: 1 1/8 by 4 1/2 inches.
2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.
3. Markers for Junction Boxes: 1/2 by 2 1/4 inches.

C. Legend:
1. Markers for Voltage Identification: Highest voltage present.
2. Markers for System Identification:
a. Emergency Power System: Text "EMERGENCY".

D. Color: Black text on orange background unless otherwise indicated.

2.04 UNDERGROUND WARNING TAPE

A. Materials: Use non-detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.

B. Non-detectable Type Tape: 6 inches wide, with minimum thickness of 4 mil.

C. Legend: Type of service, continuously repeated over full length of tape.

D. Color:
1. Tape for Buried Power Lines: Black text on red background.
2. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

2.05 FLOOR MARKING TAPE

A. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches wide, with alternating black and white stripes.

2.06 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 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.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, drawings, shop drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout project.

C. 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: Enclosure front.
   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. Boxes: Outside face of cover.
   8. Conductors and Cables: Legible from the point of access.
   9. Devices: Outside face of cover.

D. Install identification products centered, level, and parallel with lines of item being identified.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Unless labels and nameplates are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

G. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

H. Install underground warning tape above buried lines with one tape per trench at 6 inch(es) below finished grade.

I. Secure rigid signs using stainless steel screws.

J. Mark all handwritten text, where permitted, to be neat and legible.

K. Conductors To Be Extended in the Future: Attach write-on tags to conductors and list source.

L. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

M. Equipment To Be Labeled:
   1. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a self-adhesive, engraved, laminated acrylic or melamine label.
   2. Enclosures and electrical cabinets.
   3. Access doors and panels for concealed electrical items.
   4. Switchboards.
   5. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
   6. Substations.
   7. Emergency system boxes and enclosures.
   8. Motor-control centers.
   9. Enclosed switches.
   10. Enclosed circuit breakers.

11. Enclosed controllers.
12. Variable-speed controllers.
13. Push-button stations.
14. Power-transfer equipment.
15. Contactors.
16. Remote-controlled switches, dimmer modules, and control devices.

END OF SECTION

SECTION 26 09 23
LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Time switches.

B. Outdoor photo controls.

1.02 RELATED REQUIREMENTS

A. Section 26 05 29 - Hangers and Supports for Electrical Systems

B. Section 26 05 33.16 - Boxes for Electrical Systems.

C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

D. Section 26 27 26 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, and fan speed controllers.
   1. Includes finish requirements for wall controls specified in this section.

1.03 REFERENCE STANDARDS

A. 47 CFR 15 - Radio Frequency Devices; current edition.

B. ANSI C136.24 - American National Standard for Roadway and Area Lighting Equipment - Nonlocking (Button) Type Photocontrols; 2004 (R2010).

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

F. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control; Current Edition, Including All Revisions.

G. UL 916 - Energy Management Equipment; Current Edition, Including All Revisions.

H. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.

I. UL 60947-1 - Low-Voltage Switchgear and Controlgear - Part 1: General Rules; Current Edition, Including All Revisions.

J. UL 60947-4-1 - Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-starters - Electromechanical Contactors and Motor-starters; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.
   2. Coordinate the placement of wall switch occupancy sensors with actual installed door swings.
   3. Coordinate the placement of photo sensors for daylighting controls with windows, skylights, and luminaires to achieve optimum operation. Coordinate placement with ductwork, piping, equipment, or other potential obstructions to light level measurement installed under other sections or by others.
   4. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.

1. Occupancy Sensors: Include detailed motion detection coverage range diagrams.

C. Shop Drawings:
   1. Provide lighting plan indicating location, model number, and orientation of each sensor and associated system component.

D. Operation and Maintenance Data: Include detailed information on device programming and setup.

E. Project Record Documents: Record actual installed locations and settings for lighting control devices.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for all sensors.

PART 2 PRODUCTS

2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

2.02 TIME SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Refer to drawings and controls schedules for listed manufacturers.

B. Digital Electronic Time Switches:
   1. Description: Factory-assembled solid state programmable controller with LCD display, listed and labeled as complying with UL 916 or UL 917.
   2. Program Capability:
      a. Astronomic Time Switches: Four channel, capable of different schedule for each day of the weekwith additional holiday schedule available to override normal schedule for selected days and field-configurable astronomic feature to automatically adjust for seasonal changes in sunrise and sunset times.
   3. Schedule Capacity: Not less than 16 programmable on/off operations.
   4. Provide automatic daylight savings time and leap year compensation.
   5. Provide power outage backup to retain programming and maintain clock.
   6. Manual override: Capable of overriding current schedule both permanently and temporarily until next scheduled event.
   7. Provide remote photocell input.
   8. Input Supply Voltage: As indicated on the drawings.
   9. Output Switch Configuration: As required to control the load indicated on drawings.
   10. Output Switch Contact Ratings: As required to control the load indicated on drawings.
   11. Provide lockable enclosure; environmental type per NEMA 250 as specified for the following installation locations:
      a. Indoor clean, dry locations: Type 1.
      b. Outdoor locations: Type 3R.

2.03 OUTDOOR PHOTO CONTROLS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Refer to drawings and controls schedules for listed manufacturers.

B. Stem-Mounted Outdoor Photo Controls:
   1. Description: Direct-wired photo control unit with threaded conduit mounting stem and field-adjustable swivel base, listed and labeled as complying with UL 773A.
   2. Housing: Weatherproof, impact resistant polycarbonate.
   3. Photo Sensor: Cadmium sulfide.
   4. Light Level Activation: 1 to 5 footcandles turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.
   5. Voltage: As required to control the load indicated on the drawings.
   6. Failure Mode: Fails to the on position.
   7. Load Rating: As required to control the load indicated on the drawings.
   8. Provide accessory wall-mounting bracket where indicated or as required to complete installation.

C. Button Type Outdoor Photo Controls
   1. Description: Direct-wired photo control unit complying with ANSI C136.24 with weatherproof gasketed wall plate where required or indicated, listed and labeled as complying with UL 773A.
   2. Housing: Weather resistant polycarbonate.
   3. Photo Sensor: Cadmium sulfide.
   4. Light Level Activation: 1 to 3 footcandles turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.
   5. Voltage: As required to control the load indicated on the drawings.
   6. Failure Mode: Fails to the on position.
   7. Load Rating: As required to control the load indicated on the drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130.

B. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of lighting control devices provided under this section.
   1. Mounting Heights: Unless otherwise indicated, as follows:
      a. Wall Switch Occupancy Sensors: 48 inches above finished floor.
      b. In-Wall Interval Timers: 48 inches above finished floor.
   2. Orient outlet boxes for vertical installation of lighting control devices unless otherwise indicated.
   3. Locate wall switch occupancy sensors on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect to obtain direction prior to proceeding with work.

C. Install lighting control devices in accordance with manufacturer's instructions.

D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

E. Install lighting control devices plumb and level, and held securely in place.

F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 26 27 26.

G. Provide required supports in accordance with Section 26 05 29.

H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface 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.

I. Identify lighting control devices in accordance with Section 26 05 53.

J. Occupancy Sensor Locations:
   1. Location Adjustments: Locations indicated are diagrammatic and only intended to indicate which rooms or areas require devices. Provide quantity and locations as required for complete coverage of respective room or area based on manufacturer's recommendations for installed devices.
   2. Install and aim sensors in locations to achieve complete coverage. Do not exceed coverage limits specified in manufacturer's written instructions.

K. Outdoor Photo Control Locations:
   1. Where possible, locate outdoor photo controls with photo sensor facing north. If north facing photo sensor is not possible, install with photo sensor facing east, west, or down.
   2. Locate outdoor photo controls so that photo sensors do not face artificial light sources, including light sources controlled by the photo control itself.

L. Install outdoor photo controls so that connections are weatherproof. Do not install photo controls with conduit stem facing up in order to prevent infiltration of water into the photo control.

M. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.

N. Where indicated, install separate compatible wall switches for manual control interface with lighting control devices or associated power packs.

O. Where indicated or required, provide cabinet or enclosure in accordance with Section 26 05 33.16 for mounting of lighting control device system components.

3.02 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Inspect each lighting control device for damage and defects.

D. Test time switches to verify proper operation.

E. Test outdoor photo controls to verify proper operation, including time delays where applicable.

F. Correct wiring deficiencies and replace damaged or defective lighting control devices.

3.03 ADJUSTING

A. Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

B. Adjust devices and wall plates to be flush and level.

C. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.

D. Adjust time switch settings to achieve desired operation schedule as indicated or as directed by Architect.

E. Adjust external sliding shields on outdoor photo controls under optimum lighting conditions to achieve desired turn-on and turn-off activation as indicated or as directed by Architect.

3.04 CLOSEOUT ACTIVITIES

A. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Instructor: Manufacturer's authorized service representative.
   3. Location: At project site.

END OF SECTION

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SECTION 26 56 00
EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior luminaires.

B. Poles and accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Materials and installation requirements for concrete bases for poles.

B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

C. Section 26 05 29 - Hangers and Supports for Electrical Systems.

D. Section 26 05 33.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

A. IES LM-63 - IESNA Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).

B. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; 2008.

C. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; 2015, with Errata (2017).

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

E. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2006.

F. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; 2016.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 1598 - Luminaires; Current Edition, Including All Revisions.

I. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:

C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.

1. LED Luminaires:
   a. Include estimated useful life, calculated based on IES LM-80 test data.
   b. Include IES LM-79 test report upon request.
2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IES LM-63 standard format upon request.
3. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.

H. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.03 BALLASTS AND DRIVERS

A. Ballasts/Drivers - General Requirements:
   1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
   2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
   3. Electronic Ballasts/Drivers: Inrush currents not exceeding peak currents specified in NEMA 410.

B. Dimmable LED Drivers:
   1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
   2. Control Compatibility: Fully compatible with the dimming controls to be installed.

2.04 POLES

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. All Poles:
   1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.
   2. Finish: Match luminaire finish, unless otherwise indicated.
   3. Mounting: Install on concrete foundation, height as indicated on the drawings, unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of luminaires provided under this section.

B. Install products in accordance with manufacturer's instructions.

C. Install luminaires in accordance with NECA/IESNA 501.

D. Provide required support and attachment in accordance with Section 26 05 29.

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Pole-Mounted Luminaires:
   1. Foundation-Mounted Poles:
      a. Provide cast-in-place concrete foundations for poles as indicated per electrical drawing details, in accordance with Section 03 30 00.
         1) Install anchor bolts plumb per template furnished by pole manufacturer.
         2) Position conduits to enter pole shaft.
      b. Install foundations plumb.
      c. Install poles plumb, using leveling nuts or shims as required to adjust to plumb.
      d. Tighten anchor bolt nuts to manufacturer's recommended torque.
      e. Install anchor base covers or anchor bolt covers as indicated.
   2. Embedded Poles: Install poles plumb as indicated.
   3. Grounding:
      a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.
      b. Provide supplementary ground rod electrode as per electrical drawing details and specified in Section 26 05 26 at each pole bonded to grounding system as indicated.
   4. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.

G. Install accessories furnished with each luminaire.

H. Bond products and metal accessories to branch circuit equipment grounding conductor.

I. Install lamps in each luminaire.

3.02 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.03 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

END OF SECTION

SECTION 31 20 00

EXCAVATION AND EARTHWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Clearing and Grubbing

B. Earthwork, Excavation, and Embankment Construction

C. Subgrade Preparation

D. Subbase Construction

E. Topsoil

1.02 DESCRIPTION OF WORK

Excavate and construct embankments, subgrades, and subbases.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following:

Submit results of Standard Proctor and in-place density tests on compactions when required.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

If impractical, or if scheduling does not allow the removal of utilities before excavation, work around the utilities.

PART 2 - PRODUCTS

2.01 TOPSOIL

Use suitable topsoil of uniform quality, free from hard clods, roots, sod, stiff clay, hard pan, stones larger than 1 inch (1/2 inch for turfgrass seeding), lime cement, ash, slag, concrete, tar residue, tarred paper, boards, chips, sticks, or any undesirable material.

Use on-site topsoil, unless compost-amended or off-site topsoil is specified.

A. **On-site Topsoil:** On-site topsoil material is material excavated from the top 12 inches of the site. Use of on-site topsoil material is subject to the Engineer's approval.

B. **Compost-amended On-site Topsoil:** Amend low-quality on-site topsoil, not meeting the requirements specified for off-site topsoil, with a minimum of 1 inch of compost for every 3 inches of topsoil. Use compost meeting the requirements of mulch for pneumatic seeding in Section 32 92 19.

C. **Off-site Topsoil:** Contains at least 3% organic matter, according to ASTM D 2974, has a high degree of fertility, is free of herbicides that prohibit plant growth, has a pH level between
6.0 and 8.0, and meets the following mechanical analysis requirements:

Sieve	Percent Passing
1"	100
1/2"	95* to 97*
1/4"	40 to 60
No. 100	40 to 60
No. 200	10 to 30

* 100% for turfgrass

The Engineer will approve the source of off-site topsoil. Surface soils from ditch bottoms, drained ponds, and eroded areas, or soils that are supporting growth of noxious weeds or other undesirable vegetation, will not be accepted. The Engineer will determine if testing is necessary. The Contractor will be responsible for payment of the testing if the off-site topsoil does not meet the above requirements. If the testing verifies the off-site topsoil does meet the above requirements, payment for the testing will be the responsibility of the Jurisdiction.

2.02 EXCAVATION MATERIALS

All project site and borrow excavation will be classified as Class 10, Class 12, or Class 13 as defined below, and as indicated in the contract documents.

A. **Class 10 Excavation:**

1. Class 10 excavation includes all normal soil such as loam, silt, gumbo, peat, clay, soft shale, sand, and gravel. It includes fragmentary rock handled in the manner normal to this class of excavation.

2. Includes any combination of the above described materials and any other material not classified as Class 12 or Class 13.

B. **Class 12 Excavation:**

1. Material deposits so firmly cemented together that they cannot be removed without continuous use of pneumatic tools or blasting.

2. Class 12 excavation includes the actual measured volume of granite, trap, quartzite, chert, limestone, sandstone, hard shale, or slate in natural ledges or displaced masses.

3. Also includes the estimated or measured volume of rock fragments or boulders that occur on the surface or in subsurface deposits mixed with soil, sand, or gravel when their size, number, or location prevents them from being handled in a manner normal to Class 10 excavation.

C. Class 13 Excavation:

1. Class 13 excavation includes all materials listed under the definitions of Classes 10 and 12, and any other material encountered, regardless of its nature.

2. This classification covers work commonly referred to as "unclassified excavation."

3. The contract documents will specify the limits for Class 13 excavation. Excavation within these limits will not be classified as Class 10 or Class 12 excavation.

D. Unsuitable or Unstable Materials:

1. Material encountered during excavation above or below grade that does not meet the suitable soil requirements in Section 31 20 00, 2.03.

2. Rubbish and debris, including trees, stumps, waste construction materials, scrap metals, and other materials that cannot be buried or used for backfill or topsoil.

3. Moisture content does not determine suitability of materials.

E. Borrow: Unless otherwise provided in the contract documents, when the quantity of fill material required is not available within the limits of the project cross-sections or specific borrow areas as indicated, the Contractor should make up the deficiency from borrow areas provided by the Engineer, or furnish equivalent material from other borrow areas.

2.03 SUITABLE EMBANKMENT MATERIALS

Meet the following requirements for all soils provided for the construction of embankments:

A. Density of 95 pcf or greater according to ASTM D 698 or AASHTO T 99 (Standard Proctor Density).

B. AASHTO M 145 group index of less than 30.

C. Liquid limit (LL) less than 50.

D. Soils not meeting these requirements are considered unsuitable soils, regardless of classification.

E. For soils to be placed below water, use clean granular material.

2.04 FOUNDATION MATERIALS

A. Select Subgrade Materials:

1. All soils required for select subgrade materials must be approved by the Engineer. Approval of materials and their use will be based on AASHTO M 145.
   a. Cohesive soils must meet all of the following requirements:
      1) 45% or less silt size fraction.
      2) Density of 110 pcf or greater according to ASTM D 698 or AASHTO T 99 (Standard Proctor Density).
      3) Plasticity index greater than 10.
      4) A-6 or A-7-6 soils of glacial origin.

b. Granular soils must meet all of the following requirements:
   1) Density of 110 pcf or greater according to ASTM D 698 or AASHTO T 99 (Standard Proctor Density).
   2) 15% or less silt and clay.
   3) Plasticity index of 3 or less.
   4) A-1, A-2, or A-3 (0).

2. Crushed stone, crushed PCC, crushed composite pavement, or RAP; mixtures of gravel, sand, and soil; or uniformly-blended combinations of the above; as approved by the Engineer.

3. The Engineer may authorize a change in select subgrade materials subject to materials available locally at time of construction.

B. Granular Stabilization Materials:

4. Clean, crushed stone or crushed concrete, with the following gradation:

Sieve	Percent Passing
2 1/2”	100
2”	90 to 100
1 1/2”	35 to 70
1”	0 to 20
1/2”	0 to 5

5. The Engineer may authorize a change in gradation, subject to materials available locally at time of construction.

C. Subgrade Treatment:

1. Cement: Comply with Section 32 13 13.

2. Asphalt: Comply with AASHTO M 140.

3. Fly ash: Provide Class C meeting the requirements of ASTM C 618 with a minimum of 22% CaO; the Loss of Ignition requirements in Table 1 will not apply. Approval of source required.

4. Lime: Hydrated lime should meet requirements of ASTM C 207, Type N or AASHTO M 216, and others.

5. Geogrid:
   a. Rectangular or Square: Use an integrally-formed grid structure manufactured of a stress-resistant polypropylene material. Use Type 1 geogrid, unless Type 2 is specified. Meet the following minimum physical properties:

Table 2010.02: Geogrid (Rectangular or Square)

Property	Test Method	Units	Type 1[1]	Type 2
Aperture stability modulus at 20 kg-cm	Kinney[2] - 01	kg-cm/deg	3.2	6.5
Minimum true initial modulus in use				
Machine direction (MD)	ASTM D 6637	lb/ft	15,080	32,890
Cross Machine direction (CMD)			20,560	44,725
Tensile strength, 2% strain				

MD	ASTM D 6637	lb/ft	270	410
CMD			380	590
Junction efficiency	GRI-GG2-87	%	93	93
Flexural rigidity	ASTM D 1388	mg-cm	250,000	750,000
Aperture size				
Minimum	N/A	in.	0.5	0.5
Maximum			2.0	2.0

[1] Geogrids meeting the requirements of Iowa DOT Article 4196.01, B and Materials I.M. 496.01 will be acceptable.
[2] Dr. Thomas C. Kinney, P.E. and US Army Corps of Engineers.

b. Triangular: Use punched and drawn polypropylene that is oriented in three substantially equilateral directions. Meet the following minimum physical properties:

Table 2010.03: Geogrid (Triangular)

Property	Test Method	Units	Type 3	Type 4
Aperture stability modulus at 5 kg-cm	Kinney[1] - 01	kg-cm/deg	3.0	3.6
Resistance to loss of load capacity				
Chemical resistance	EPA 9090 Immersion	%	90-100	90-100
Ultra-violet light and weathering (500 hrs)	ASTM D 4355			
Junction efficiency	GRI-GG2-87 GRI-GG1-87	% of ultimate tensile strength	93	93
Radial stiffness	ASTM D 6637	lb/ft @ 0.5% strain	15,000	20,000
Rib Pitch				
Longitudinal	N/A	in.	1.5-1.75	1.5-1.75
Diagonal				
Mid-rib depth	N/A	in.	0.04-0.06	0.05-0.08
Mid-rib width	N/A	in.	0.035-0.05	0.035-0.055

[1] Dr. Thomas C. Kinney, P.E. and US Army Corps of Engineers.

6. Geotextiles: Use a woven or non-woven permeable fabric, manufactured of polymer fibers, meeting the requirements of Iowa DOT Article 4196.01, B, 5.

D. Subbase:

1. Special Backfill:
a. Comply with Iowa DOT Specifications Section 4132. The quality requirements of Iowa DOT Materials I.M. 210 for recycled pavements are waived.
b. The Engineer may authorize a change in gradation subject to materials available locally at time of construction.

2. Granular Subbase:
c. Comply with Iowa DOT Specifications Section 4121.
d. The Engineer may authorize a change in gradation subject to materials available locally at time of construction.

3. Modified Subbase:
e. Comply with Iowa DOT Specifications Section 4123.
f. The Engineer may authorize a change in gradation, subject to materials

available locally at time of construction.

PART 3 - EXECUTION

3.01 CLEARING AND GRUBBING

A. Notification: Notify the Engineer prior to start of clearing and grubbing activities.

B. Tree Cutting:

1. **October 1 through March 31:** No restrictions on tree cutting.

2. **April 1 through September 30:** Cut trees only after authorized by the Engineer and upon receiving a copy of the Determination of Effect indicating no affect to threatened or endangered species is expected within the work area.

C. Removal: Remove the following items:

1. Trees and stumps, including roots, to a depth of at least 12 inches. Place backfill to fill the hole.

2. Logs and downed timber.

3. Hedge rows, brush, field fence, and agricultural products.

4. Vegetation and rubbish.

5. Other objectionable materials.

D. Disposal: Dispose of material from clearing and grubbing according to Iowa Administrative Code 567-23.2 and must meet local ordinances. If burning is not allowed, proceed as follows:

1. Process by chipping logs, downed timber, or brush for mulching material; or salvage logs and downed timber for firewood.

2. Other vegetation, including corn stubble, may be disked into the existing soil if approved by the Engineer.

3. Haul vegetative materials from clearing and grubbing that are not handled on the project to a yard waste disposal site.

4. Remove field fence and other non-vegetative materials from the project.

3.02 TOPSOIL

Prior to placement of all types of topsoil, finish excavation and embankment work according to the specified grades and cross-sections considering topsoil requirements; grade and slope all surfaces to drain away from buildings and prevent ponding. Conform to the grading plan within ± 2 inches. Till or rip constructed surface to a minimum depth of 4 inches to reduce compaction prior to topsoil placement.

A. On-Site Topsoil:

1. **Stripping and Salvaging:**
   a. Mow all weeds, grass, and growing crops or other herbaceous vegetation close to

the ground and remove from the site. Shred sod by shallow plowing or blading and thorough disking. Thoroughly shred to allow the soil to be easily spread in a thin layer over areas to be covered. If allowed by the Engineer, herbicides may be applied, and vegetation may be incorporated into the topsoil.

b. Remove an adequate amount of topsoil from the upper 12 inches of existing on-site topsoil to allow finish grading with a finished grade of 8 inches of salvaged topsoil. The topsoil may be moved directly to an area where it is to be used, or may be stockpiled for future use.

2. **Spreading and Finish Grading:**
   a. Place topsoil at least 8 inches deep; smooth and finished grade according to the contract documents.
   b. After finish grading the topsoil, till surface to a minimum depth of 4 inches. Remove clods, lumps, roots, litter, other undesirable material, or stones larger than 1 inch (1/2 inch for turfgrass).

B. Compost Amended Topsoil: Furnish and spread compost a uniform thickness blended according to Section 31 20 00, 2.01. Incorporate compost into underlying soil. Grade the compost amended soil. Till area a minimum depth of 4 inches to loosen surface from compaction during placement. Remove clods and stones and other undesirable materials.

C. Off-site Topsoil: Transport and spread 8 inches of approved off-site topsoil, unless otherwise specified. Grade and till the area a minimum depth of 4 inches to loosen surface from compaction during placement. Remove clods, lumps, roots, litter, other undesirable material, or stones larger than 1 inch (1/2 inch for turfgrass).

3.03 EXCAVATION

A. Notification: Notify the Engineer prior to start of excavation activities.

B. Pavement Removal:

1. Cut surface pavement to full depth as required, and at designated removal lines.

2. Remove all pavement materials.
   a. If specified in the contract documents or allowed by the Engineer, process for re-use.
   b. Dispose of excess material as follows:
      1) Use as unsuitable soil according to this section.
      2) If specified in the contract documents, deliver and stockpile at a site designated by the Engineer.
      3) Otherwise, properly dispose of off-site.

3. Remove pavement material broken or damaged by the Contractor beyond designated removal lines to new line designated by the Engineer, and replaced at the Contractor′s expense.

4. Protect subgrade beneath existing pavement removal areas.

C. Excavation: Perform Class 10, 12, or 13 grading, as specified in the contract documents, to the prescribed grade.

D. Shaping of Borrows:

1. Ensure that borrow areas provided by the Contractor are regular in cross-section to

allow accurate measurement.

2. Ensure that care is taken to blend to natural land forms and avoid unnecessary damage to the land.

3. Do not divert natural drainage of surface water onto adjoining owners, and be diligent in draining the surface water in its natural course or channel.

4. Complete excavation in a way consistent with the existing natural drainage conditions.

E. Drainage:

1. Provide temporary drainage facilities to prevent damage to public or private interests when necessary to interrupt natural drainage or flow of artificial drains.

2. Restore original drainage as soon as work allows.

3. The Contractor is responsible for damage resulting from their neglect to provide erosion control or artificial drainage.

F. Unsuitable or Unstable Materials:

1. Remove unsuitable or unstable materials to a depth specified in the contract documents, or as directed by the Engineer.

2. The Engineer will determine the need for and type of backfill material, including select soil or granular subbase.

3. Remove all soft areas. Replace with approved materials.

4. If subbase materials are used, provide weight tickets at the time of delivery.

5. Dispose of unsuitable or unstable materials according to the requirements in this section.

G. Removal of Boulders: Remove all boulders with a minimum diameter of 6 inches.

H. Rock Excavation:

1. When excavation to the subgrade elevation results in a surface consisting of loose or solid rock:
   a. Excavate 1 foot below the finished subgrade elevation.
   b. Construct subgrade with suitable material.
   c. Conduct operations so the Engineer is given the opportunity to measure cross- section before placement of subgrade material.

2. When pre-splitting of rock cuts is necessary, the limits of the area and the procedure used will be subject to the approval of the Engineer.

3. Dispose of rocks and boulders 6 inches in diameter and greater off-site.

I. Removal or Filling of Pipe Culverts, Pipes, and Conduits: Remove, plug, and/or fill with flowable mortar, as directed by the Engineer.

3.04 EMBANKMENT CONSTRUCTION

A. Notification: Notify the Engineer prior to start of embankment activities.

B. Site Preparation:

1. Remove all ground cover from the area.

2. When an embankment is placed on or against an existing slope that is steeper than 3:1 and is more than 10 feet high, cut the slope into steps as the construction of the new embankment progresses. The steps should ensure that all sod or other potential sliding surfaces are removed. Cut each step or series of steps to approximate horizontal planes which have vertical slope dimensions of at least 3 feet.

C. Depositing Embankment Material:

1. Except for rock fills and granular blankets, deposit embankment material in horizontal layers no greater than 8 inches in loose thickness. Do not incorporate vegetative materials in embankments. If some otherwise suitable soil contains small amounts of vegetative materials, such soils may be deposited outside of the shoulder line, within the outer 3 feet of the embankment.

2. When the width at the attained height is 30 feet or more, divide the area upon which the layer is to be placed into separate and distinct dump areas, having widths of at least 15 feet. If hauling equipment is operated within a dump area, cover the area with at least one passage of a tandem-axle disk, or two passages with a single-axle disk, prior to compaction.

3. Keep hauling equipment off dump areas of embankments 36 feet or more in width during compaction operations. Within 36 feet of a bridge or other limiting structure, or where the width of the embankment is less than 36 feet at the attained height, empty hauling units may travel on the dump area during compaction operations, as necessary to pass loaded hauling units. If the design width of the embankment is less than 30 feet at the attained height, hauling units will be allowed to travel through areas where compaction operations are in progress. When any hauling equipment is allowed to pass through compaction operations, do not require water, disking, and compacting equipment to deviate from their intended paths.

4. Deposit the material over the dump area as a separate and distinct operation. If the material, as deposited, contains an average of more than one lump per square yard, large enough to have at least one dimension greater than 12 inches, cover the area by at least one passage of a tandem-axle disk, or two passages of a single-axle disk. Use a disk that is designed and operated to cut and stir to the full depth of the layer.

5. After depositing and disking, if required, smooth the material to a uniform depth with a suitable motor patrol, bulldozer, or self-propelled sheepsfoot-type roller with a blade attachment. In addition to the initial smoothing operation, continue this smoothing and leveling of the lift during compaction, as necessary to provide a surface area free from ruts and other objectionable irregularities.

   Use the self-propelled sheepsfoot-type roller (meeting the requirements of Iowa DOT Article 2001.05) under the following conditions:
   a. Leveling must be done according to the prescribed rolling pattern.
   b. Compaction should be the primary function of the unit.
   c. Prevent spinning of the power drums.
   d. When, in the opinion of the Engineer, the unit cannot satisfactorily accomplish both leveling and rolling, use a separate dozer or motor patrol for the leveling operation prior to initiation of compaction.
   e. For embankments constructed primarily of sand or other granular material, the Contractor may substitute a pneumatic-tired roller meeting the requirements of Iowa DOT Article 2001.05.

6. Keep the outer portion of an embankment lower than its center, and wherever construction will be suspended for a period during which rain is likely to occur, roughen the surface to prevent erosion. This can be done by tracking, disking, or scarifying. Stones 6 inches and smaller in diameter may be placed in embankments, but distributed to avoid pockets. No stones larger than 3 inches may be placed within 1 foot of the finished subgrade elevation.

D. Compaction with Moisture and Density Control: Compact with moisture and density control, unless Type A compaction is specified in the contract documents. See Section 31 20 00, 3.09 for moisture and density requirements.

E. Type A Compaction: When Type A compaction is specified in the contract documents, compact as follows:

1. After the surface layer has been smoothed, and before material for the next layer is deposited on it, compact the layer with at least one passage of the sheepsfoot-type roller per inch of loose thickness of the layer, until the roller is supported entirely on its feet. The roller will be considered to be supported entirely on its feet when the tamping feet penetrate no more than 3 inches into an 8 inch lift or layer being compacted.

2. Determine if moisture content of the material is excessive or suitable for satisfactory compaction.
   a. Start rolling operations immediately after the smoothing operation, or delay them, and instead aerate the material in preparation for rolling.
   b. Perform aeration and compaction operations without unnecessary delay.
   c. Rolling operations made prior to any aeration operations for a lift will not be counted as any of the required coverages.

3. If the material is dry to the extent that it will not likely be satisfactorily compacted by rolling, moisten the material.
   a. The Engineer may order the material to be moistened uniformly before it is compacted.
   b. The Engineer may authorize the use of water in the final finishing of the roadbed.
   c. Delays from the ordering of moistening or drying will be at the Contractor's expense.

4. The Contractor may substitute compaction with moisture and density control for Type A Compaction, providing all testing as required, at the Contractor's expense.

3.05 USE OF UNSUITABLE SOILS

Unsuitable soils are not allowed in the right-of-way, unless otherwise specified in the contract documents or allowed by the Engineer.

3.06 SUBGRADE PREPARATION

Shape and consolidate subgrade in preparation for the placement of pavement.

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.

1. Subgrade Compaction in Fill Sections:
   a. Follow the compaction with moisture and density control requirements in

Section 31 20 00, 3.04.
b. Construct in two 6 inch lifts.

2. Subgrade Compaction in Cut Sections:
   a. Excavate and stockpile the top 6 inches of subgrade.
   b. Scarify, mix, and re-compact the next 6 inches of subgrade.
   c. Replace, mix, and compact the top 6 inches of subgrade.
   d. Follow the compaction with moisture and density control requirements in Section 31 20 00, 3.09.

3. Remove stones over 3 inches from subgrade.

4. Construct to elevation and cross-section such that, after rolling, surface will be above required subgrade elevation.

B. Subgrade Stability:

1. Perform proof rolling with a truck loaded as designated by the Engineer using either:
   a. A single axle or tandem truck fully loaded with rock or soil to the top of the truck's sideboards; or
   b. A single axle truck loaded with a rear axle weight of 13,500 pounds and total vehicle weight of 20,000 pounds or a tandem axle truck loaded with rear axle weight of 34,000 pounds and a total weight of 46,000 pounds. Verify axle and truck weights by tickets from a certified scale.

2. Operate trucks at less than 10 mph. Make multiple passes for every lane. The subgrade will be considered to be unstable if, under the operation of the loaded truck, the surface shows yielding (soil wave in front of the loaded tires) or rutting of more than 2 inches, measured from the top to the bottom of the rut at the outside edges.

3. If soft or yielding areas are located, remove unstable materials and replace with suitable foundation materials as approved by the Engineer, meeting Section 31 20 00, 2.04. Compact subgrade materials in cut sections as required by the Engineer. If stabilization material is used, place and compact as required for subbase.

C. 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.

D. Subgrade Check: Check subgrade elevation and grade by method approved by Engineer prior to paving.

E. 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.

3.07 SUBGRADE TREATMENT

A. Lime, Cement, Fly Ash, or Asphalt:

1. Incorporate the subgrade treatment material uniformly during subgrade preparation to the depth and rate specified in the contract documents.

2. Place subgrade treatment in the areas specified in the contract documents for the width of the pavement, plus 2 feet on each side.

B. Geogrid or Geotextiles:

1. Install according to manufacturer's recommendations, on top of the prepared subgrade.

2. Place in the areas specified in the contract documents for the width of the pavement, plus 2 feet on each side.

3.08 SUBBASE

A. Subgrade: Compact subgrade and shape smooth before subbase material is placed.

B. Construction: Construct the specified type of subbase to the specified depth, plus 2 feet outside the pavement area.

C. Moisture and Density: Compact subbase and provide testing according to Section 31 20 00, 3.09.

D. Final Elevation:

1. Trim to the design elevation and shape to the final template with an automatically-controlled trimming machine. Excess material may be salvaged and spread for use on any other approved project location or operation.

2. Conform to the design profile and cross-section to the extent that no point is higher than the designated elevation, and no point is lower than 0.05 foot below the design elevation.

3. Ensure that the top 1 inch of the subbase is uniformly moist prior to paving.

4. Do not allow hauling equipment and other traffic on completed subbase.

3.09 FIELD QUALITY CONTROL

A. Compaction Testing: If it is specified in the contract documents that the Contractor will conduct compaction testing, use the services of an independent testing laboratory approved by the Engineer.

B. Moisture Content and Density:

1. Ensure that moisture content falls within a range of optimum moisture to 4% above optimum moisture.

2. Compact cohesive soils to no less than 95% of maximum Standard Proctor Density; and cohesionless soils to no less than 70% of Relative Density.

C. Testing:

1. Lab Test: Determine laboratory density of material according to ASTM D 698 or AASHTO T 99 (Standard Proctor Density) or ASTM D 4253 and ASTM D 4254 (Maximum and Minimum Index Density for Cohesionless Soils). Provide at least one analysis for each material type used unless provided by the Engineer.

2. Field Test:
   a. Perform in-place field density and moisture testing according to ASTM D 6938 (nuclear) or ASTM D 1556 (sand cone) and ASTM D 2216 (moisture content).
   b. Frequency:
      1) Urban Section: Provide one test per lift per 150 feet. If section is less than 300 feet, perform at least two tests per lift.
      2) Rural Section: Provide one test for each 500 cubic yards of material placed, with at least two tests per lift.

3. Test only locations selected by the Engineer.

4. The Engineer may require additional testing if noncompliance or change in conditions occur.

D. Test Failure: Rework, recompact, and retest as necessary until required compaction is achieved.

END OF SECTION

SECTION 31 23 33

TRENCH EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Trench Excavation for Pipe Systems

B. Trench Foundation Stabilization

C. Pipe Bedding and Backfill

1.02 DESCRIPTION OF WORK

A. Excavate trench for pipe installation.

B. Stabilize trench and install pipe bedding materials.

C. Place backfill material in trench.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following:

A. Gradation reports for bedding materials.

B. Results of required testing.

C. Dewatering plan.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 MATERIALS EXCAVATED FROM A TRENCH

A. Standard Trench Excavation: All materials encountered during trench excavation, except rock and over-excavation.

1. Suitable Backfill Material: Class II, Class III, Class IVA, or Class IVB as

defined in Section 31 23 33, 2.02.

2. **Unsuitable Backfill Material:** Includes, but is not limited to, the following materials:
   a. Soils not classified as suitable backfill material, as defined in Section 31 23 33, 2.02.
   b. Individual stones or concrete chunks larger than 6 inches and averaging more than one per each cubic foot of soil.
   c. Frozen materials.
   d. Stumps, logs, branches, and brush.
   e. Trash, metal, or construction waste.
   f. Soil in clumps or clods larger than 6 inches, and without sufficient fine materials to fill voids during placement.
   g. Environmentally contaminated soils.
   h. Materials removed as rock excavation or over-excavation.

3. **Topsoil:** Class V material. Comply with Section 31 23 33, 2.03.

B. Rock Excavation: Boulders or sedimentary deposits that cannot be removed in trenches without continuous use of pneumatic tools or blasting.

C. Over-excavation: Excavation of unsuitable or unstable material in trenches below the pipe zone, comply with SUDAS Figure 3010.101.

2.02 BEDDING MATERIAL

A. Class I Material:

1. Crushed stone complying with the following gradation:

Sieve	Percent Passing
1 1/2”	100
1”	95 to 100
1/2"	25 to 60
No. 4	0 to 10
No. 8	0 to 5

2. The Engineer may allow the use of gravel or authorize a change in gradation subject to materials available locally at the time of construction.

3. The Engineer may authorize the use of crushed PCC for pipe sizes up to 12 inches.

4. Use aggregates having a percentage of wear, Grading A or B, not exceeding 50%, determined according to AASHTO T 96.

2.03 BACKFILL MATERIAL

A. Class II Material: Manufactured and non-manufactured open-graded (clean) or dense- graded (clean) processed aggregate, clean sand, or coarse-grained natural soils (clean) with little or no fines. Class II materials are further described in Table 3010.01.

Table 3010.01: Class II Materials

	Soil Group		Percentage Passing Sieve Sizes

Type	Symbol ASTM D 2487	Description	1 1/2 in.	No. 4	No. 200
Coarse-Grained Soils, clean	GW	Well-graded gravels and gravel-sand mixtures; little or no fines.	100%	< 50% of "Coarse Fraction"	< 5%
	GP	Poorly-graded gravels and gravel-sand mixtures; little or no fines.			
	SW	Well-graded sands and gravelly sands; little or no fines.		> 50% of "Coarse Fraction"	
	SP	Poorly-graded sands and gravelly sands; little or no fines.			
Coarse-Grained Soils, borderline clean to with fines	e.g. GW-GC, SP-SM	Sands and gravels that are borderline between clean and with fines.	100%	Varies	5% to 12%

B. Class III Material:

1. Natural coarse-grained soils with fines. Class III materials are further described in Table 3010.02.

2. Do not use where water condition in trench may cause instability.

Table 3010.02: Class III Material

Table	Soil Group Symbol ASTM D 2487	Description
Coarse-Grained Soils, with fines	GM	Silty gravels, gravel-sand-silt mixtures.
	GC	Clayey gravels, gravel-sand-clay mixtures.
	SM	Silty sands, sand-silt mixtures.
	SC	Clayey sands, sand-clay mixtures.

C. Class IVA Material:

1. Natural fine-grained inorganic soils. Class IVA materials are further described in Table 3010.03.

2. The Engineer will determine if material is not suitable for use as backfill material under deep fills, surface applied wheel loads, heavy vibratory compactors, tampers, or other conditions.

3. Do not use where water conditions in trench may cause instability.

4. Material is suitable for use in dry trench conditions only.

Table 3010.03: Class IVA Material

Type	Soil Group Symbol ASTM D 2487	Description
	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity.

Fine-Grained Soils (inorganic)	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clay, lean clay.

D. Class IVB Material:

1. Natural fine-grained inorganic (high elastic silts and plastic clays - fat clay) with a liquid limit greater than 50%. Class IVA materials are further described in Table 3010.04.

2. When approved by the Engineer, material may be used as final trench backfill in a dry trench.

3. Do not use in the pipe embedment zone.

Table 3010.04: Class IVB Material

Type	Soil Group Symbol ASTM D 2487	Description
Fine-Grained Soils (inorganic)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	CH	Inorganic clays of high plasticity, fat clays.

2.04 TOPSOIL

A. Class V Material:

1. Organic soils. Class V materials are further described in Table 3010.05.

2. Use only as topsoil outside of the pavement, unless otherwise specified or allowed by the Engineer.

3. Do not use in the pipe embedment zone.

Table 3010.05: Class V Material

Type	Soil Group Symbol ASTM D 2487	Description
Organic Soils (unsuitable for backfill)	OL	Organic silts and organic silty clays of low plasticity.
	OH	Organic clays of medium to high plasticity, organic silts.
Highly Organic (unsuitable for backfill)	PT	Peat and other high organic soils.

2.05 STABILIZATION (FOUNDATION) MATERIALS

A. Clean 2 1/2 inch crushed stone with the following gradation:

Table 3010.06: Stabilization Materials

Sieve	Percent Passing

2 1/2”	100
2”	90 to 100
1 1/2”	35 to 70
1”	0 to 20
1/2”	0 to 5

B. If specified, meet Iowa DOT Section 4128 for Gradation No. 13a screened over a 1 inch screen or the Engineer may authorize a change in gradation depending on materials available locally at time of construction.

C. Crushed concrete may be used, if approved by the Engineer, if it is within ± 5% of the gradation for each size of material.

2.06 SPECIAL PIPE EMBEDMENT AND ENCASEMENT MATERIAL

A. Concrete Cradle, Arch, or Encasement: Use Iowa DOT Class C concrete.

B. Flowable Mortar: Comply with Iowa DOT Article 2506.02.

C. CLSM:

1. Approximate quantities per cubic yard:
   a. Cement: 50 pounds
   b. Fly ash: 250 pounds
   c. Fine aggregate: 2,910 pounds
   d. Water: 60 gallons

2. A compressive strength of at least 50 psi compressive strength at 28 calendar days can be expected.

3. Comply with material requirements of Iowa DOT Article 2506.02.

D. Foamed Cellular Concrete:

4. If specified or approved by the Engineer, foamed cellular concrete may be substituted for flowable mortar.

5. Comply with Iowa DOT Article 2506.02.

6. Submit mix design to the Engineer. Include base cement slurry mix per cubic yard, expansion factor from the foaming agent, and wet density.

PART 3 - EXECUTION

3.01 TRENCH EXCAVATION

A. Notify the Engineer prior to the start of excavation activities.

B. Remove topsoil to a minimum depth of 12 inches and stockpile.

C. Excavate trench to required elevations and dimensions. Comply with SUDAS Figure 3010.101.

1. Protect existing facilities, trees, and shrubs during trench excavation.

2. Place excavated material away from trench.

3. Grade spoil piles to drain. Do not allow spoil piles to obstruct drainage.

D. Unsuitable Backfill Material:

1. If unsuitable backfill material is encountered, notify the Engineer.

2. Remove rock, rubbish, boulders, debris, and other unsuitable backfill materials at least 6 inches below and on each side of the pipe.

3. Keep unsuitable backfill material separated from suitable backfill material and topsoil.

4. Restore trench to design dimensions using bedding or stabilization material.

3.02 ROCK OR UNSTABLE SOILS IN TRENCH BOTTOM

A. Notify the Engineer prior to over-excavation.

B. The Engineer will determine the need for over-excavation and trench foundation stabilization prior to installation of pipes and structures.

C. Comply with SUDAS Figure 3010.101 for over-excavation of rock and wet or soft foundations.

3.03 TRENCH PROTECTION

A. Install adequate trench protection (sheeting, shoring, and bracing) to prevent ground movement or damage to adjacent structures, pipelines, and utilities.

B. Move trench boxes carefully to avoid disturbing pipe, bedding, or trench wall.

3.04 DEWATERING

A. Maintain water levels below the bottom of trench excavation.

B. Perform the dewatering operation according to the dewatering plan approved by the Engineer. The dewatering plan may be modified to meet actual field conditions, with approval of the Engineer.

C. Ensure operation of the dewatering system does not damage adjoining structures and facilities. Cease dewatering operations and notify the Engineer if damage is observed.

D. Discharged Water:

1. Do not discharge water into sanitary sewers.

2. Discharging water into storm sewers requires Engineer's approval.

3. Obtain permission of adjacent property owner prior to discharging water onto their property.

4. Maintain and control water discharge as necessary to prevent a safety hazard for vehicular and pedestrian traffic.

5. Direct water discharge away from electrical facilities or equipment.

6. Use dewatering equipment that will minimize disturbance from noise and fumes.

7. Protect discharge points from erosion. Provide sediment control for sediment contaminated water discharged directly from trench.

3.05 PIPE BEDDING AND BACKFILL

A. General: Comply with SUDAS Figures 3010.101, 3010.102, 3010.103, 3010.104, and 3010.105, as appropriate.

1. Bedding and backfill used for pipe installation will depend on:
   a. Type of installation (water main, sanitary sewer gravity main, sanitary sewer force main, or storm sewer).
   b. Pipe material.
   c. Depth of bury.
   d. Pipe diameter.

2. After pipe installation, place remaining bedding material and immediately place backfill in trench.

3. Adjust the moisture content of excessively wet, but otherwise suitable, backfill material by spreading, turning, aerating, and otherwise working material as necessary to achieve required moisture range.

4. Adjust the moisture content of excessively dry, but otherwise suitable, backfill material by adding water, then turning, mixing, and otherwise blending the water uniformly throughout the material until the required moisture range is achieved.

5. Hydraulic compaction (flooding with water) is not allowed unless authorized by the Engineer.

6. Special Pipe Embedment and Encasement Materials:
   a. If specified, use concrete, flowable mortar, CLSM, or foamed cellular concrete as a substitute for pipe bedding, haunch support, or primary and secondary backfill.
   b. Secure pipe against displacement or flotation prior to placing special pipe embedment and encasement material.
   c. Place Class IV clay material for a waterstop and compacted to 90% of Standard Proctor Density. Obtain required compaction within a soil moisture range of optimum moisture to 4% above optimum moisture content. If trench stabilization material is used, extend waterstop through stabilization material to the bottom of the trench.

B. Pipe Bedding:

1. Granular Material:
   a. Class I granular bedding material is required for all gravity mains. Use when specified for pressure pipes.
   b. Comply with SUDAS Figures 3010.101, 3010.102, 3010.103, 3010.104, and 3010.105.
   c. Place bedding material in the bottom of the trench in lifts no greater than 6 inches thick. Consolidate and moderately compact bedding material.
   d. Shape bedding material to evenly support pipe at the proper line and grade, with full contact under the bottom of the pipe. Excavate for pipe bells.
   e. Install pipe and system components.
   f. Place, consolidate, and moderately compact additional bedding material adjacent to the pipe to a depth equal to 1/6 the outside diameter of the pipe.

2. **Suitable Backfill Material:**
   a. Only use with pressure pipe. Comply with SUDAS Figure 3010.104.
   b. Use suitable backfill material to shape trench bottom to evenly support pipe at the proper line and grade, with full contact under the bottom of the pipe. Excavate for pipe bells.

C. Haunch Support: Place from the top of the pipe bedding to the springline of the pipe.

1. **Granular Material:**
   a. Place Class I material in lifts no greater than 6 inches thick.
   b. Consolidate and moderately compact by slicing with a shovel or using other approved techniques.

2. **Suitable Backfill Material:**
   a. Place in lifts no greater than 6 inches thick.
   b. For Class II backfill material, consolidate and moderately compact by slicing with a shovel or using other approved techniques.
   c. For Class III and Class IVA backfill materials, compact to at least 90% of Standard Proctor Density. Obtain required compaction within a soil moisture range of optimum moisture to 4% above optimum moisture content.

D. Primary and Secondary Backfill:

1. **General:**
   a. For primary backfill, place from the springline of the pipe to the top of the pipe.
   b. For secondary backfill, place from the top of the pipe to 1 foot above the top of the pipe.

2. **Granular Material:**
   a. Place in lifts no greater than 6 inches thick.
   b. Compact to at least 65% relative density.

3. **Suitable Backfill Material:**
   a. Place in lifts no greater than 6 inches thick.
   b. For Class II backfill material, compact to at least 65% relative density.
   c. For Class III and Class IVA backfill materials, compact to at least 95% of Standard Proctor Density. Obtain required compaction within a soil moisture range of optimum moisture to 4% above optimum moisture content.

E. Final Trench Backfill:

1. Place suitable backfill material from 1 foot above the top of the pipe to the top of the trench.
   a. Use no more than 8 inch thick lifts for backfill areas more than 3 feet below the bottom of pavement.
   b. Use no more than 6 inch thick lifts for backfill areas less than or equal to 3 feet below the bottom of pavement.

2. Place backfill material after recording locations of connections and appurtenances or at the Engineer's direction.

3. Class I and Class II Backfill Material:
   a. Compact to at least 65% relative density within right-of-way.
   b. Compact to at least 50% relative density outside right-of-way.

4. Class III and Class IVA Backfill Material:

a. Compact to at least 95% of Standard Proctor Density within right-of-way.
b. Compact to at least 90% of Standard Proctor Density outside right-of-way.
c. Obtain required compaction within a soil moisture range of optimum moisture to 4% above optimum moisture content.

5. In areas to remain unpaved, terminate backfill material 8 inches below finished grade. Use topsoil for the final 8 inches above trench backfill material.

6. Terminate backfill material at subgrade elevation in areas to be paved.

3.06 TRENCH COMPACTION TESTING

A. General: When trench compaction testing is specified in the contract documents as the Contractor's responsibility, provide testing of trench backfill material using the services of an independent testing laboratory approved by the Engineer.

B. Soil Testing:

1. Cohesive Soils:
a. Determine moisture-density relationships by ASTM D 698 (Standard Proctor). Perform at least one test for each type of cohesive soil used.
b. Determine in-place density and moisture content. Use ASTM D 1556 (sand-cone method) and ASTM D 2216 (laboratory moisture content), or use ASTM D 6938 (nuclear methods for density and moisture content).

2. Cohesionless Soils:
a. Determine maximum and minimum index density and calculate relative density using ASTM D 4253 and ASTM D 4254.
b. For Class I granular bedding material, determine gradation according to ASTM C 136.

C. Field Testing:

1. Testing Frequency and Locations: Perform testing of the final trench backfill, beginning at a depth of 2 feet above the top of the pipe, as follows:
a. Coordinate the timing of testing with the Engineer.
b. The Engineer will determine the location of testing.
c. For each 2 vertical feet of consolidated fill, provide tests at a maximum horizontal spacing of 200 feet and at all street crossings.
d. Additional testing may be required by the Engineer in the event of non-compliance or if conditions change.
e. If necessary, excavate to the depth and size as required by the Engineer to allow compaction tests. Place backfill material and recompact.

2. Test Failure and Retesting: Rework, recompact, and retest as necessary until specified compaction and moisture content is achieved in all areas of the trench. In the event of failed tests, the Engineer may require retesting as deemed necessary.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. NPDES General Permit No. 2

B. Stormwater Pollution Prevention Plan (SWPPP)

C. Erosion Control Measures

D. Velocity and Flow Control Measures

E. Sediment Control Measures

F. Application/Installation of Measures

G. Removal/Replacement of Measures

1.02 DESCRIPTION OF WORK

A. Furnish all materials; install, construct, maintain, and remove specified erosion control devices; at locations specified in the contract documents, or where specified by the Engineer.

B. Complete the required construction work on this project, while minimizing soil erosion and controlling water pollution. Maintain these features as specified, from initial construction stages to final completion of the project.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following:

Upon request, provide copies of all records and documentation related to compliance with the Iowa DNR NPDES Permit.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions, as well as the following:

A. Implement erosion and sediment control measures at the appropriate time(s).

B. Coordinate construction to minimize damage to erosion and sediment control devices.

1.07 SPECIAL REQUIREMENTS

A. Permit:

1. When applicable, comply with the requirements of the Iowa Department of Natural Resources, *NPDES (National Pollutant Discharge Elimination System) General Permit No. 2 for Stormwater Discharge Associated with Industrial Activity for Construction Activities*, and the Stormwater Pollution Prevention Plan.

2. For projects covered under the Iowa DNR General Permit No. 2, sign on as a co-permittee with the owner and any other contractors or subcontractors.

3. When applicable, comply with the local jurisdiction's permitting requirements.

B. Protection of Property: Prevent accumulation of soil, sediment, or debris from project site onto adjoining public or private property. Remove any accumulation of soil or debris immediately, and take remedial actions for prevention.

C. Permit Compliance: When applicable, conduct all operations in compliance with the Iowa DNR NPDES General Permit No. 2. Labor, equipment, or materials not included as a bid item, but necessary to prevent stormwater contamination from construction related sources, are considered incidental. Incidental work related to compliance with the permit may include, but is not limited to: hazardous materials protection, fuel containment, waste disposal, and providing employee sanitary facilities.

D. Project Staging: Replacing erosion and sediment control practices that are damaged or removed by the contractor in a manner that is inconsistent with the current project staging or SWPPP is the Contractor's responsibility and will be at the Contractor's expense.

PART 2 - PRODUCTS

2.01 COMPOST BLANKETS

Comply with Section 32 92 05 for compost material requirements for compost blankets.

2.02 COMPOST BLANKET AND FILTER BERM TACKIFIER

A. Use a biodegradable, organic binding agent or polyacrylamide that can be mixed with, or injected into, compost or filter material as it is placed, which is not detrimental to the establishment of vegetation.

B. Use in filter berms or compost blankets when specified in the contract documents.

C. Apply at the rate recommended by the manufacturer.

2.03 FILTER MATERIAL

Material for use in filter socks, filter berms, and other areas, as specified in the contract documents.

A. Use material derived from wood, bark, or other, non-toxic vegetative feedstocks.

B. Use material with no visible admixture of refuse or other physical contaminants, nor

any material toxic to plant growth.

C. Use material meeting the following particle sizes:

Sieve Size	Percent Passing[1]
2”	100
1”	90-100
3/8”	0-30

[1]The target flow rate of in-place material is 10 gal/min/lf. The Engineer may approve use of alternate materials meeting the target flow rate.

2.04 FILTER SOCK

A. For slope and sediment control applications, use a continuous, tubular, knitted, mesh netting with 3/8 inch openings, constructed of 5 mil thickness, photodegradable HDPE.

B. For inlet protection, use a continuous, tubular, knitted, mesh netting with 3/8 inch openings, constructed of 500 denier polypropylene.

C. Use 1 inch by 2 inch (minimum) hardwood stakes or stakes of equivalent strength.

2.05 TEMPORARY ROLLED EROSION CONTROL PRODUCTS (RECP)

Use temporary rolled erosion control products that are classified and have material properties according to the Erosion Control Technology Council’s (ECTC) guidelines as follows:

A. Material Classification:

1. **RECP Type 1 (Ultra Short-term):** Functional longevity of 3 months or less and classified as follows:
   a. **RECP Type 1.A:** Mulch control net, consisting of a photodegradable synthetic mesh or woven biodegradable natural fiber netting.
   b. **RECP Type 1.B:** Netless rolled erosion control blankets, consisting of natural and/or polymer fibers, mechanically interlocked and/or chemically adhered together to form a RECP.
   c. **RECP Type 1.C:** Single-net erosion control blankets and open weave textiles, consisting of processed degradable natural and/or polymer fibers, mechanically bound together by a single rapidly-degrading, synthetic or natural fiber netting, or an open weave textile of processed rapidly-degrading natural or polymer yarns or twines woven into a continuous matrix.
   d. **RECP Type 1.D:** Double-net erosion control blankets, consisting of processed degradable natural and/or polymer fibers, mechanically bound together between two rapidly-degrading, synthetic or natural fiber nettings.

2. **RECP Type 2 (Short-term):** Functional longevity between 3 and 12 months and classified as follows:
   a. **RECP Type 2.A:** Mulch control net, consisting of a photodegradable synthetic mesh or woven biodegradable natural fiber netting.
   b. **RECP Type 2.B:** Netless rolled erosion control blankets, consisting of natural and/or polymer fibers, mechanically interlocked and/or chemically adhered together to form a RECP.
   c. **RECP Type 2.C:** Single-net erosion control blankets and open weave textiles, consisting of an erosion control blanket composed of processed degradable natural or polymer fibers, mechanically bound together by a single degradable synthetic or natural fiber netting to form a continuous matrix, or an open weave textile composed of processed degradable natural or polymer yarns or twines

woven into a continuous matrix.

d. **RECP Type 2.D:** Double-net erosion control blanket, consisting of processed degradable natural and/or polymer fibers, mechanically bound together between two degradable synthetic or natural fiber nettings.

3. **RECP Type 3 (Extended Term):** Functional longevity between 12 and 24 months and classified as follows:
   a. **RECP Type 3.A:** Mulch control nets, consisting of a slow-degrading synthetic mesh or woven natural fiber netting.
   b. **RECP Type 3.B:** Erosion control blankets and open weave textiles, consisting of processed slow-degrading natural or polymer fibers, mechanically bound together between two slow-degrading synthetic or natural fiber nettings to form a continuous matrix, or an open weave textile composed of processed slow-degrading natural or polymer yarns or twines woven into a continuous matrix.

4. **RECP Type 4 (Long Term):** Functional longevity of 36 months and classified as follows: Erosion control blankets and open weave textiles, consisting of processed slow- degrading natural or polymer fibers, mechanically bound together between two slow degrading synthetic or natural fiber nettings to form a continuous matrix, or an open weave textile composed of processed slow-degrading natural or polymer yarns or twines woven into a continuous matrix.

B. Properties and Performance:

1. Testing performed according to the ECTC's Testing Procedures for Rolled Erosion Control Products. Verify manufacturer's test results by independent testing.

2. Material properties meeting the Erosion Control Technology Council's (ECTC) Standard Specifications for Rolled Erosion Control Products as follows:

Classification	Slope Application	Channel Application	Min. Tensile Strength
	Max. Grade*	Permissible Shear Stress	
RECP Type 1.A	5:1 (H:V)	0.25 lb/ft^2	5 lb/ft
RECP Type 1.B	4:1 (H:V)	0.50 lb/ft^2	5 lb/ft
RECP Type 1.C	3:1 (H:V)	1.50 lb/ft^2	50 lb/ft
RECP Type 1.D	2:1 (H:V)	1.75 lb/ft^2	75 lb/ft
RECP Type 2.A	5:1 (H:V)	0.25 lb/ft^2	5 lb/ft
RECP Type 2.B	4:1 (H:V)	0.50 lb/ft^2	5 lb/ft
RECP Type 2.C	3:1 (H:V)	1.50 lb/ft^2	50 lb/ft
RECP Type 2.D	2:1 (H:V)	1.75 lb/ft^2	75 lb/ft
RECP Type 3.A	5:1 (H:V)	0.25 lb/ft^2	25 lb/ft
RECP Type 3.B	1.5:1 (H:V)	2.00 lb/ft^2	100 lb/ft
RECP Type 4	1:1 (H:V)	2.25 lb/ft^2	125 lb/ft

*Product tested according to ECTC Test Method No. 2 and meeting the ECTC Standard Specifications for "C" factor.

C. RECP Anchors: Stakes or staples as recommended by manufacturer, with a minimum length of 6 inches.

2.06 WATTLES

A. Netting: Open weave, degradable netting. Nominal diameter of 9 inches, or as specified.

B. Fill Material: Straw, wood excelsior, coir, or other natural materials approved by the Engineer.

C. **Stakes:** 1 inch by 1 inch (minimum) wooden stakes, or stakes of equivalent strength.

2.07 CHECK DAMS

A. **Synthetic Permeable Check Dam (HDPE):**

1. **Ditch Berm:**
   a. Installed height of 9 to10 inches.
   b. Manufactured check dam constructed from sheets of perforated, UV-stabilized High Density Polyethylene (HDPE).
   c. Perforations of 30 to 40% open area.

2. **RECP for Permeable Check Dam (when specified):** RECP Type 4, 4 feet wide.

3. **Anchors:** As recommended by the manufacturer.

B. **Triangular Foam Check Dam:** Triangular-shaped device with a height of 8 to 10 inches and a base of 16 to 20 inches.

1. **Inner Support Material:** Urethane foam.

2. **Outer Cover:** Woven geotextile material shaped to fit around the inner support material, extending 2 to 3 feet beyond the bottom edge of the triangular-shaped inner support.

3. **Length:** 7 feet.

C. **Rock Check Dam:**

1. **Aggregate:** Erosion stone complying with Iowa DOT Article 4130.04.

2. **Engineering Fabric:** Comply with Section 31 25 00, 2.20.

2.08 LEVEL SPREADERS

A. Provide 2 inch by 8 inch (minimum) pressure-treated timber of the length specified.

B. Use timbers that are relatively straight and have a minimum length of 5 feet each.

2.09 RIP RAP

A. **Class A Revetment:** Comply with Iowa DOT Section 4130.

B. **Class B Revetment:** Comply with Iowa DOT Section 4130.

C. **Class D and E Revetment:** Comply with Iowa DOT Section 4130.

D. **Erosion Stone:** Comply with Iowa DOT Section 4130.

2.10 TEMPORARY PIPE SLOPE DRAINS

A. PVC, HDPE, and metal pipes as specified in Section 33 42 11.

B. HDPE, Type C (corrugated interior).

C. All pipes listed are allowed for use within the right-of-way.

2.11 SEDIMENT BASIN OUTLET STRUCTURES

A. Base: Class C concrete unless otherwise specified in the contract documents.

B. Riser: CMP complying with Section 33 42 11; diameter as specified in the contract documents.

C. Dewatering Device:

1. Drill holes in the riser of the number, diameter, and at the elevation specified in the contract documents.

2. 1/4 inch by 1/4 inch or 1/2 inch by 1/2 inch wire mesh for hardware cloth.

D. Barrel: CMP complying with Section 33 42 11; diameter as specified in the contract documents.

E. Anti-Vortex Device: CMP complying with Section 33 42 11; diameter according to SUDAS Figure 9040.116 and riser diameter as specified in the contract documents.

F. Anti-Seep Collar:

1. Corrugated metal sheet of same material and gage as barrel section.

2. Size according to SUDAS Figure 9040.117.

2.12 SEDIMENT TRAPS

A. Erosion Stone: Comply with Section 31 25 00, 2.09.

B. Engineering Fabric: Comply with Section 31 25 00, 2.20.

2.13 SILT FENCE

A. Fabric: Comply with Iowa DOT Article 4196.01.

B. Posts: 4 foot minimum steel (T-section) weighing at least 1.25 pounds per foot, exclusive of anchor plate. Painted posts are not required.

C. Fastener: Wire or plastic ties with a minimum tensile strength of 50 pounds.

2.14 STABILIZED CONSTRUCTION ENTRANCE

A. Entrance Stone: Comply with Iowa DOT Section 4122, Gradation 13, Macadam crushed stone.

B. Subgrade Stabilization Material: Use woven, UV-stabilized geotextile with a minimum tensile strength of 135 lb/ft.

2.15 DUST CONTROL

A. Water: Use potable water or water from a source approved by the engineer.

B. **Calcium Chloride:** Comply with Iowa DOT Article 4194.01.

C. **Lignosulfonate (Tree Sap):** Use a commercially-available product with known lignin content.

D. **Soapstock (Soybean Oil):**

1. Use a commercially-available, undiluted, soybean oil soapstock emulsion.

2. Comply with manufacturer's recommendations for storage, transportation, temperature, and application equipment requirements.

2.16 EROSION CONTROL MULCH

A. **Conventional Mulch:**

1. Use dry cereal straw (oats, wheat, barley, or rye) or native grass straw.

2. Use material that is free of noxious weeds, seed-bearing stalks, or roots, and will be inspected and approved by the Engineer prior to use.

3. Other materials, subject to the approval of the Engineer, may be used.

B. **Hydromulch:**

1. **Wood Cellulose Mulch:** Comply with Section 32 92 05.

2. **Bonded Fiber Matrix (BFM):** Comply with Section 32 92 05.

3. **Mechanically Bonded Fiber Matrix (MBFM):** See Section 32 92 05.

2.17 TURF REINFORCEMENT MATS (TRM)

A. **Material Classification:**

1. **TRM Type 1:** Use a TRM that is constructed of a web of mechanically or melt-bonded polymer netting, monofilaments, or fibers that are entangled to form a strong and dimensionally stable mat. Bonding methods include polymer welding, thermal or polymer fusion, or the placement of synthetic fibers between two high-strength, biaxially-oriented nets, mechanically bound by parallel stitching with polyolefin thread. Products may contain a degradable component.

2. **TRM Type 2 and 3:** Use a TRM that is constructed of a web of mechanically or melt-bonded polymer netting, monofilaments, or fibers that are entangled or woven to form a strong and dimensionally stable mat. Non-woven bonding methods include polymer welding, thermal or polymer fusion, or the placement of fibers between two high-strength, biaxially oriented nets, mechanically bound by parallel stitching with polyolefin thread. Use only components that are 100% synthetic and resistant to biological, chemical, and ultraviolet degradation.

3. **TRM Type 4:** Use a high performance/survivability TRM that is composed of monofilament yarns woven into a resilient uniform configuration. Use a mat that has a matrix that exhibits very high interlock and reinforcement capacities with both soil and root systems and demonstrate a high tensile modulus. TRMs manufactured from discontinuous or loosely held together by stitched or glued, netting, or composites are not allowed in this category. Use only components that are 100% synthetic and

resistant to biological, chemical, and ultraviolet degradation. Use this category when field conditions exist with high loading and/or high survivability requirements.

B. Properties and Performance: Meet the minimum material and performance requirements contained in the following table:

Property[1]		Test Method	Type 1	Type 2	Type 3	Type 4
Material	Thickness	ASTM D 6525	0.25 in	0.25 in[5]	0.25 in[5]	0.25 in[5]
	Tensile Strength[2]	ASTM D 6818	125 lb/ft	240 lb/ft	750 lb/ft	3,000 lb/ft
	UV Resistance[3]	ASTM D 4355	80% @ 500 hrs	80% @ 1,000 hrs	80% @ 1,000 hrs	90% @ 3,000 hrs
Performance	Maximum Shear Stress[4] (Channel Applications)	ASTM D 6460	7 lb/ft^2	10 lb/ft^2	12 lb/ft^2	15 lb/ft^2

1 For TRMs containing degradable components, all values must be obtained on the non-degradable portion of the matting.
2 Minimum Average Roll Values, machine direction only.
3 Tensile strength of structural components retained after UV exposure.
4 Minimum shear stress that fully-vegetated TRM can sustain without physical damage or excess erosion (0.5 in soil loss) during a 30 minute flow event in large scale testing. Acceptable large scale testing protocol includes ASTM D 6460 or independent testing conducted by the Texas Transportation Institute, Colorado State University, Utah State University, or other approved testing facility. Bench scale testing is not acceptable.
5 Type 2, 3, and 4 TRM may include additional degradable components as long as material and performance requirements are met by the 100% synthetic components.

2.18 INLET PROTECTION

A. Drop-in Intake Protection:

1. Use a manufactured device that is inserted into the intake and is capable of trapping or filtering sediment from runoff prior to entering the storm sewer.

2. All components must be contained entirely below the surface of the intake grate.

3. Incorporate means of emergency outflow to prevent flooding if plugged with sediment.

B. Surface-applied Intake Protection:

1. Use devices or filter socks, placed around or over the intake, that are capable of trapping or filtering sediment from runoff prior to entering the storm sewer.

2. Do not allow the device to completely block or plug the intake, preventing inflow.

2.19 FLOW TRANSITION MATS

Comply with the following and Iowa DOT Materials I.M. 469.10.

A. Mat:

1. Constructed of 85% minimum UV resistant material with a maximum ground cover of 80%.

2. Meet the requirements of the following table:

Property	Test Method	Value
Mass/Unit Area (max.)	ASTM D 6566	3 lbs/SF
Minimum Thickness	ASTM D 6525	0.4 inch
Maximum Thickness	ASTM D 6525	1.1 inch
Tensile Strength	ASTM D 6818	550 lbs/ft
Minimum Percent Open Area	ASTM D 6567	20%
UV Stability	ASTM D 4355	85%

B. Anchoring Devices:

1. Furnish bullet tip style anchors made of a metal alloy attached to a wire rope.

2. Anchors capable of withstanding a minimum 300 pounds (136 kg) of pull out resistance in cohesive soils.

3. Wire rope a minimum of 30 inches (762 mm) in length with a minimum breaking strength of at least 300 pounds (136 kg).

4. The top washer a minimum of 3 inches (76 mm) in diameter and constructed of a UV resistant plastic.

5. Each anchor equipped to allow the retightening of the anchor when deemed necessary by the Engineer.

2.20 ENGINEERING FABRIC

Comply with Iowa DOT Article 4196.01, B, 3.

PART 3 - EXECUTION

3.01 SWPPP PREPARATION

A. Prepare a SWPPP according to the requirements of the Iowa DNR NPDES General Permit No. 2.

B. Ensure that controls utilized in the SWPPP conform to the type and quantity of erosion and sediment controls specified in the contract documents.

C. Submit the completed SWPPP to the Engineer for review and approval prior to filing the Notice of Intent.

D. Upon approval of the Engineer, file public notices, as required by the NPDES General Permit No. 2.

E. File the Notice of Intent and fee, as required by the NPDES General Permit No. 2.

3.02 SWPPP MANAGEMENT

Coordinate and carry out all requirements of Iowa DNR NPDES General Permit No. 2 and any local ordinance requirements, including:

A. Update the SWPPP according to the requirements of the NPDES General Permit No. 2.

B. Revise the SWPPP and implement changes, as necessary, to prevent sediment or hazardous materials from being transported off the site.

C. Submit all SWPPP revisions to the Engineer for review and approval.

D. Perform and maintain records of weekly erosion and sediment control site inspections, unless otherwise specified in the contract documents.

E. Maintain records of transfer of responsibility under the NPDES General Permit No. 2.

F. Retain all records on-site, or as required by the NPDES General Permit No. 2.

G. After final stabilization, file a Notice of Discontinuation, according to the NPDES General Permit No. 2.

H. Provide all records and documentation to the Engineer upon completion of the project. Retain a copy of all records for the period required under the Permit.

I. Continue to perform the work required under this item throughout the duration of the project, and until final stabilization is achieved and a Notice of Discontinuation is filed.

3.03 EROSION AND SEDIMENT CONTROL INSPECTION

A. Perform inspections according to and at frequency required by the Iowa DNR NPDES General Permit No. 2.

B. Schedule necessary maintenance or improvements for items that are included in the contract documents.

C. Notify the Engineer immediately of situations requiring attention beyond that provided for in the contract documents.

D. Provide copies of the inspection reports to the Engineer.

3.04 EQUIPMENT

Comply with Iowa DOT Article 2601.03.

3.05 COMPOST BLANKETS (SUDAS Figure 9040.101)

A. Loosen the ground surface to a minimum depth of 1 inch.

B. Evenly spread compost, as specified in the contract documents, or as directed by the Engineer.

C. Divert concentrated flows away from the slope.

D. Do not operate heavy equipment over the compost blanket after placement, or throughout the required period of protection.

E. Inspect the ground under the blanket at regular intervals for signs of erosion.

3.06 FILTER BERMS (SUDAS Figure 9040.102)

A. Install filter berm along the contour as specified in the contract documents, or as

directed by the Engineer.

B. Turn the ends of the filter berm uphill to prevent runoff from flowing around the end of the berm.

C. When a vegetated berm is specified, apply seed to the surface of the berm.

D. Replace the berm when sediment accumulation reaches one-half of the height of the berm.

3.07 FILTER SOCKS (SUDAS Figure 9040.102)

A. Installation:

1. Fill mesh filter sock with filler material to the size and length specified in the contract documents.

2. Place the filter sock along the contour as specified in the contract documents, or as directed by the Engineer.

3. Construct a “J-hook” at each end of a continuous run of filter sock, by turning the end of the sock uphill, as necessary to prevent runoff from flowing around the ends when water behind the sock ponds up to a level even with the top of the sock.

4. Drive stakes into the ground at a maximum spacing of 10 feet, and as required to secure the sock and prevent movement.

5. Repair or replace non-functioning filter socks that allow water to flow under the sock, are torn, or are otherwise damaged, due to inadequate installation.

6. Remove filter material from damaged socks that are located along streambanks, around intakes, in ditches, or in other locations where the material may be carried to surface waters.

B. Removal: When specified in the contract documents, or as directed by the Engineer; remove the filter sock upon completion of the project, and after final stabilization is achieved; or as indicated in the SWPPP, if applicable.

1. Upon completion of the project, completely remove socks and filter material that are located along streambanks, around intakes, in ditches, or in other locations where the filter material may be carried to surface waters if the sock degrades and/or tears.

2. Slice the sock longitudinally. Remove and dispose of the filter sock material and stakes.

3. Spread the filter material and accumulated sediment to match finished grade and to ensure proper drainage.

4. If the site has been brought to finished grade and prepared for permanent seeding, spread and incorporate the filter material into the surface by tilling, or as required to break up any large particles and provide a finished surface suitable for permanent seeding.

C. Replacement:

1. When accumulated sediment reaches a level one-half the height of the sock, or when the sock becomes clogged with sediment and no longer allows runoff to flow through,

remove the sock as described above, and replace according to the installation instructions above.

2. At the Engineer's option, the existing filter sock and accumulated sediment may be left in place, and a new filter sock installed up-slope from the existing filter sock.

3.08 TEMPORARY ROLLED EROSION CONTROL PRODUCTS (RECP) (SUDAS Figures 9040.103 and 9040.104)

Install temporary RECPs according to the manufacturer's published installation recommendations, subject to the following minimum requirements:

A. Slope Application:

1. Grade and smooth surface. Remove all rocks, clods, vegetation, or other obstructions that will prevent direct contact between the RECP and the soil surface.

2. When specified, prepare seedbed and place seed and fertilizer according to Section 32 92 05 prior to placing RECP.

3. Install anchor trench at top of slope. Seed and fertilize trench after backfill and compaction, if seeding is specified.

4. Unroll the RECP down or horizontally across the slope.

5. Place consecutive blankets down the slope end-over-end, shingle style.

6. Overlap ends of consecutive rolls a minimum of 3 inches, and install anchors at a maximum spacing of 18 inches along all overlaps.

7. Overlap edges of adjacent rolls a minimum of 2 inches.

8. Install anchors at edge seams between rows.

B. Channel/Ditch Application:

1. When specified, prepare seedbed and place seed and fertilizer according to Section 32 92 05 prior to placing RECP.

2. Place end of first roll in the anchor slot at the center of the upstream channel and secure with anchors.

3. Position adjacent rolls in the anchor slot, overlapping adjacent rolls a minimum of 3 inches.

4. Place backfill material in anchor slot and compact. Unroll RECP over compacted slot and secure with anchors.

5. Unroll RECP downstream. Maintain a minimum 3 inch overlap between adjacent rolls. Secure edge lap with anchors.

6. Install intermittent staple check slots every 30 feet.

7. Construct end lap at end of roll and beginning of new roll. Overlap roll ends with upstream RECP on top.

8. Excavate longitudinal trench along both sides of the channel at the outside edges of installation. Place outer edges of RECP into longitudinal slot. Install anchors, place backfill material, and compact.

9. Terminate installation at downstream end with staple check.

10. Install anchors in a regular pattern over entire area covered according to manufacturer's published recommendations (minimum three anchors per square yard).

3.09 WATTLES (SUDAS Figure 9040.105)

A. Installation:

1. Construct a shallow trench, 2 to 4 inches deep, matching the width and contour of the wattle.

2. Install wattle along contour of slope.

3. Turn ends of wattle uphill to prevent water from flowing around ends.

4. Place and compact excavated soil against the wattle, on the uphill side.

5. Drive stakes through the center of the wattle, into the ground at a maximum spacing of 4 feet along the length of the wattle, and as needed to secure the wattle and prevent movement.

6. Abut ends of adjacent wattles tightly. Wrap joint with a 36 inch wide section of silt fence and secure with stakes.

B. Removal: When specified in the contract documents, or as directed by the Engineer, remove the wattle upon completion of the project, and after final stabilization is achieved; or as indicated in the SWPPP, if applicable.

1. Completely remove the wattle netting, filler material, and stakes.

2. Spread the accumulated sediment to match finished grade and to ensure proper drainage.

3. When allowed by the Engineer, the wattle netting may be sliced open and the filler material spread out over the ground. Removal of netting and stakes and spreading of sediment is still required.

C. Replacement:

1. When accumulated sediment reaches a level one-half the height of the wattle, or when the wattle becomes clogged with sediment and no longer allows runoff to flow through, remove the wattle as described above, and replace according to the installation instructions above.

2. At the Engineer's option, the existing wattle and accumulated sediment may be left in place, and a new wattle installed up-slope from the existing wattle.

3.10 CHECK DAMS (SUDAS Figure 9040.106)

A. Synthetic Permeable Check Dam (HDPE):

1. Install according to the manufacturer's recommendations.

2. When specified, provide an RECP under the check dam, installed according to the manufacturer’s recommendations.

B. Triangular Foam Check Dam: Install according to the manufacturer's recommendations.

C. Rock Check Dam: Construct according to SUDAS Figure 9040.107.

D. Removal: When specified in the contract documents, or as directed by the Engineer, remove check dams upon completion of the project, and after final stabilization is achieved; or as indicated in the SWPPP, if applicable.

1. Remove the check dam and dispose of materials, or salvage to the contractor.

2. Remove the accumulated sediment or spread to match finished grade; ensure proper drainage.

3. Stabilize the area disturbed by removal operations.

3.11 TEMPORARY EARTH DIVERSION STRUCTURES (SUDAS Figure 9040.108)

A. Ensure positive drainage along the diversion toward the outlet area.

B. Adequately compact fill to prevent failures or seepage.

C. Outlet the diversion to undisturbed and/or stabilized areas only.

D. Stabilize the surface of the earth diversion with temporary erosion control seeding, as specified in Section 32 92 05.

3.12 LEVEL SPREADERS (SUDAS Figure 9040.109)

A. Butt multiple timbers together, as necessary to provide the required length.

B. Ensure the spreader is installed level in all directions. Adjust as necessary during construction to maintain spreader in a level condition.

C. Excavate a depression behind the spreader to the depth specified in the contract documents. The depression may be over-excavated up to 1 foot to provide an area for sediment accumulation.

D. Grade as required to prevent flow around the ends of spreader.

E. Remove the accumulated sediment from the depression when the depth is reduced below that specified in the contract documents.

3.13 RIP RAP (SUDAS Figures 9040.110 and 9040.111)

Install rip rap (revetment stone or erosion stone) as shown on SUDAS Figures 9040.110 and 9040.111.

3.14 TEMPORARY PIPE SLOPE DRAINS (SUDAS Figure 9040.112)

A. Place slope drain on undisturbed soil or well compacted fill.

B. Carefully compact cohesive soils around inlet ends of the drain in 6 inch lifts.

C. Discharge slope drain to a stable outlet or to a sediment retention device.

3.15 SEDIMENT BASIN OUTLET STRUCTURES (SUDAS Figures 9040.113 and 9040.114)

A. Concrete Base: Construct the concrete base and anchor riser section, as shown on SUDAS Figure 9040.115.

B. Dewatering Device:

1. Drill holes in the riser section. The number, diameter, and configuration will be specified in the contract documents.

2. Wrap the perforated section of the riser pipe with metal hardware cloth.

C. Anti-vortex Device: If required by the contract documents, firmly attach the cylinder to the top of the riser by welding or other means. Comply with SUDAS Figure 9040.116.

3.16 ANTI-SEEP COLLAR (SUDAS Figure 9040.117)

A. General: Place backfill material and compact over-excavation areas to a minimum of 95% Standard Proctor Density per Section 31 23 33.

B. Concrete Collar:

1. Place collars a minimum of 2 feet from pipe joints.

2. Provide Class C concrete per Section 33 42 31.

C. CMP Collar:

1. Provide collar of same gage as the pipe barrel on which it is used.

2. Paint or tag unassembled collars to identify matching pairs.

3. Furnish each collar with two 1/2 inch diameter rods with tank lugs for connecting collars to pipe.

4. Install collar with corrugations vertical.

5. Seal the tap between the two half sections and between the pipe and connecting band with a bituminous jointing compound at the time of installation.

3.17 SEDIMENT TRAPS (SUDAS Figure 9040.118)

Construct the storage area to the size and elevations specified in the contract documents.

3.18 SILT FENCES (SUDAS Figure 9040.119)

A. Installation:

1. Install material along the contour of the ground, as specified in the contract

documents, or as directed by the Engineer.

2. Install silt fence with a mechanical soil slicing machine that creates a slit in the ground while simultaneously installing the fabric. The trenching method may be used when situations will not allow soil slicing, as determined by the Engineer.

3. Construct a “J-hook” at each end of a continuous run of silt fence, by turning the end of the silt fence uphill, as necessary to prevent runoff from flowing around ends when water behind the fence ponds to a level even with the top of the fence.

4. Insert 12 inches of fabric to a minimum depth of 6 inches (fabric may be folded below the ground line).

5. Compact installation by driving along each side of the silt fence, or by other means, as necessary to adequately secure the fabric in the ground, to prevent pullout and water flow under the fence.

6. Drive steel posts into the ground alongside the silt fence, to a minimum depth of 20 inches, unless otherwise specified by the Engineer. Space posts as shown on SUDAS Figure 9040.119 or as required to adequately support silt fence.

B. Maintenance: Repair or replace non-functioning silt fence that allows water to flow under the fence, is torn, or is otherwise damaged, due to inadequate installation, at no additional cost to the Contracting Authority.

C. Removal:

1. Remove the silt fence upon final stabilization of the project area, or according to the staging indicated in the SWPPP.

2. Remove and dispose of silt fence and posts.

3. Remove sediment or spread to match finished grade; ensure proper drainage.

4. Stabilize the area disturbed by removal operations.

D. Replacement:

1. When accumulated sediment reaches a level one-half the height of the fence, remove the silt fence as described above, and replace according to the installation instructions above.

2. At the Engineer’s option, the existing silt fence and accumulated sediment may be left in place, and a new silt fence installed up-slope from the existing silt fence.

3. When allowed by the Engineer, the existing silt fence may be left in place and the accumulated sediment removed to the original ground line and within 6 inches of the silt fence. Carefully inspect the existing silt fence for structural integrity and signs of undermining. Make any necessary repairs.

3.19 STABILIZED CONSTRUCTION ENTRANCE (SUDAS Figure 9040.120)

A. Install a stabilized construction entrance at all locations where construction traffic leaving the site presents the potential for sediment track-out.

B. Remove vegetation and excavate soft soils from entrance area. Thoroughly compact subgrade prior to placing stone.

C. Install culvert under entrance if necessary to maintain drainage.

D. Grade entrance to prevent runoff from flowing onto street. Direct all runoff from entrance to a sediment retention device.

E. When specified, install subgrade stabilization fabric prior to placing crushed stone.

F. Install layer of crushed stone to the thickness (6 inches minimum) and dimensions specified in the contract documents.

G. Remove the accumulated sediment and install new stone, as required to prevent track-out.

3.20 DUST CONTROL

A. Water: Apply frequent light watering to ground surface, as required to control dust.

B. Calcium Chloride: Apply according to Iowa DOT Section 2314.

C. Lignosulfonate (Tree Sap):

1. Loosen the top 1 to 2 inches of the roadway surface.
2. Apply solution with a 50% residual concentration, at a rate of 0.50 gal/yd^2, to deliver a 25% residual. For diluted solutions, increase the application rate, as required, to deliver an equivalent 25% residual.
3. Allow product to penetrate through the loosened material.
4. Tight-blade road surface.

D. Soapstock (Soybean Oil):

1. Loosen the top 1 to 2 inches of the roadway surface.
2. Apply undiluted soapstock at a rate of 0.70 gal/yd^2.
3. Allow product to penetrate through the loosened material.
4. Tight-blade road surface.

3.21 EROSION CONTROL MULCHING

A. Conventional Mulching:

1. Use conventional mulching when the surface cannot be stabilized by seeding, due to season or ground conditions.
2. Uniformly distribute mulch over the required areas, at a rate of 2 tons/acre for dry cereal straw, or 2.5 tons/acre for prairie hay.
3. Work the mulch into the soil with a mulch tucker, designed to anchor the mulch into the soil, by means of dull blades or disks.

B. Hydromulching:

1. Place mulch and tackifier (if applicable) in equipment specifically manufactured for hydraulic mulching.

2. Mix materials with fresh, potable water using a combination of re-circulation through the equipment's pump and mechanical agitation to form a homogeneous slurry.

3. If necessary, dampen any dry, dusty soil as required to prevent balling of the material during application.

4. Apply hydromulch in multiple layers from opposing directions, where possible.

5. Apply the slurry evenly over all specified areas, at the minimum component material rates specified:
   a. Wood Cellulose Mulch:
      1) Mulch: Minimum 3,000 lb/acre dry weight.
      2) Tackifier: Minimum 50 lb/acre.
   b. Bonded Fiber Matrix: Minimum 3,000 lb/acre dry weight.
   c. Mechanically Bonded Fiber Matrix: Minimum 3,000 lb/acre dry weight.

6. Retain and count empty bags of mulch to ensure final application rate.

3.22 TURF REINFORCEMENT MATS

Install according to the manufacturer's published installation literature for the product specified and application (slope or channel).

3.23 SURFACE ROUGHENING

A. Directional Tracking:

1. Do not use on slopes steeper than 3:1.

2. Operate tracked equipment up and down exposed slope to create ridges perpendicular to the slope.

3. Continue operation until the entire surface has been tracked.

B. Grooving/Furrowing:

4. May be used on all slopes.

5. Use rippers, disks, harrows, chisel plows, or other equipment capable of operating on the slope and creating grooves a maximum of 15 inches apart and 3 inches deep.

6. Operate equipment along the contour of the slope to create grooves that are perpendicular to the slope.

7. Perform over all exposed slopes as specified.

3.24 INLET PROTECTION

A. Install inlet protection devices according to the manufacturer's recommendations.

B. Remove the accumulated sediment, as required to maintain the inlet protection device in working order. Remove any accumulated sediment from streets open to traffic if it encroaches into the traveled roadway.

3.25 FLOW TRANSITION MATS

Install according to the manufacturer's published recommendations.

3.26 TEMPORARY EROSION CONTROL SEEDING

Comply with Section 32 92 05

END OF SECTION

SECTION 32 13 13

CONCRETE PAVING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Pavement

B. Curb and Gutter

1.02 DESCRIPTION OF WORK

Includes the requirements for the construction of full depth PCC pavement and curb and gutter.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following:

A. Two weeks prior to commencing any PCC pavement placement, submit a paving mix design for each different source of aggregate to be used for review and approval by the Engineer. Submit mixes or mix designs approved by the Iowa Department of Transportation or an independent testing laboratory.

B. Maturity curves for paving mixes and maturity reading results.

C. Submit all testing and certifications according to Section 32 13 13, 3.07.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, HANDLING, AND SALVAGING

Comply with General Provisions, as well as the following:

A. Aggregate Storage: Comply with Iowa DOT Article 2301.02, C.

B. Cement and Fly Ash: Comply with Iowa DOT Article 2301.02, C.

C. Admixtures: Store in suitable weather tight enclosures which will preserve quality.

D. Reinforcing Steel: Store off ground on timbers or other supports.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions, as well as the following:

Complete elements of the work that can affect line and grade in advance of other open cut construction unless noted on plans.

1.07 SPECIAL REQUIREMENTS

None

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cement: Meet the requirements of Iowa DOT Section 4101 and Materials I.M. 401, including Type I and Type II cements and blended hydraulic cements Type 1P, Type 1S, Type 1T, and Type 1L.

B. Supplementary Cementitious Materials (SCM):

1. **Fly Ash:** Comply with Iowa DOT Section 4108.

2. **Ground Granulated Blast Furnace Slag (GGBFS):** Comply with Iowa DOT Section 4108.

3. **Limestone:** Comply with Iowa DOT Materials I.M. 401.

C. Fine Aggregate for Concrete:

1. Meet the requirements of Iowa DOT Section 4110 and Materials I.M. 409, Source Approvals for Aggregates.

2. Comply with the following gradation:

Sieve Size	Percent Passing
3/8”	100
No. 4	90 to 100
No. 8	70 to 100
No. 30	10 to 60
No. 200	0 to 1.5
Iowa DOT Article 4109.02, Gradation No. 1 in the Aggregate Gradation Table.	

3. The Engineer may authorize a change in gradation, subject to materials available locally at the time of construction.

D. Coarse Aggregate for Concrete:

1. Crushed stone particles with Class 2 durability complying with Iowa DOT Section 4115 and Materials I.M. 409, Source Approvals for Aggregates.

2. Comply with one of the following gradations:

Sieve Size	Gradation No. 3 Percent Passing	Gradation No. 4 Percent Passing	Gradation No. 5 Percent Passing
1 1/2”	100	100	-----
1”	95 to 100	50 to 100	100
3/4”	-----	30 to 100	90 to 100
1/2”	25 to 60	20 to 75	-----
3/8”	-----	5 to 55	20 to 55
No. 4	0 to 10	0 to 10	0 to 10
No. 8	0 to 5	0 to 5	0 to 5
No. 200	0 to 1.5	0 to 1.5	0 to 1.5
Iowa DOT Article 4109.02, Gradation No. 3, 4, and 5 in the Aggregate Gradation Table.			

3. The Engineer may authorize a change in gradation, subject to materials available locally at the time of construction.

E. Intermediate Aggregate for Concrete: Use if specified in contract documents.

1. Meet the requirements of Iowa DOT Section 4112 and Materials I.M. 409, Source Approvals for Aggregates.

2. For crushed limestone or dolomite, meet the durability class required for the coarse aggregate. When gravel durability is lower than the coarse aggregate durability requirements, pea gravel is not to exceed 15% of the total aggregate mix.

3. Comply with the following aggregate gradation:

Sieve Size	Percent Passing
1/2”	95 to 100
3/8”	-----
No. 4	-----
No. 8	0 to 10
Iowa DOT Article 4109.02, Gradation No. 2 in the Aggregate Gradation Table	

4. The Engineer may authorize a change in gradation subject to materials locally available at the time of construction.

F. Water Requirements: Comply with Iowa DOT Section 4102. Potable water obtained from a municipal supply, suitable for drinking, may be accepted without testing.

G. Admixtures: Meet Iowa DOT Materials I.M. 403 and the requirements for the liquid admixtures shown below. Other admixtures may be used subject to the approval of the Engineer.

1. **Air Entrainment Admixture:** Comply with Iowa DOT Section 4103.

2. **Retarding and Water Reducing Admixtures:** Comply with Iowa DOT Section 4103.

3. **Accelerating admixtures (calcium chloride):** Comply with Iowa DOT Article 2529.02.

H. Bars: Comply with Iowa DOT Section 4151 for metallic tie bars and dowel bars or Iowa DOT Section 4156 for glass fiber reinforced polymer dowel bars. Meet the tie bar requirements for bar mats. All metallic bars must be epoxy coated.

I. Expansion Tubes: Comply with Iowa DOT Section 4191.

J. Metal Keyways: Comply with Iowa DOT Section 4191.

K. Supports for Bars: Comply with Iowa DOT Materials I.M. 451.01.

L. Joint Fillers and Sealers:

1. **Joint Sealers:** Comply with Iowa DOT Article 4136.02.

2. **Preformed Expansion Joint Fillers and Sealers:** Use the following types of preformed materials for filling expansion joints that comply with Iowa DOT Article 4136.03. When the type is not specified, use a resilient filler.
   - Resilient filler
   - Flexible foam expansion joint filler
   - Tire buffings expansion joint filler

- Elastomeric joint seals

M. Liquid Curing Compound: Comply with Iowa DOT Section 4105.

N. Covering:

1. **Burlap:** Comply with Iowa DOT Section 4104.

2. **Plastic Film:** Comply with Iowa DOT Section 4106.

3. **Insulating Cover:** Comply with Iowa DOT Section 4106.

O. Grout Systems: Use polymer grouts that comply with Iowa DOT Materials I.M. 491.11.

2.02 CONCRETE MIXES

A. Mix Design:

1. Comply with Iowa DOT Class C or Class M mix meeting the requirements of Materials I.M. 529. If higher durability mixes are specified, use C-SUD or CV-SUD mixes.

2. Ensure compatibility of all material combinations. If the concrete materials are not producing a workable concrete mixture, a change in the material may be required. Changes will be at no additional cost to the Contracting Authority.

B. Consistency and Workability:

1. **Slump:**
   a. Use an amount of mixing water that will produce workable concrete of uniform consistency. Unless specifically modified by the Engineer, ensure slump, measured according to Iowa DOT Materials I.M. 317, is no less than 1/2 inch or no more than 2 1/2 inches for machine finish and no less than 1/2 inch and no more than 4 inches for hand finish.
   b. If it is not possible to produce concrete having the required consistency without exceeding the maximum allowable water to cement ratio specified, the cement content may be increased or water reducing admixture may be added. Obtain the Engineer's approval. Do not exceed the maximum water to cement ratio. Additional cement or water reducer will be added with no additional cost to the Contracting Authority.
   c. The basic absolute volume of water per unit volume of concrete is based on average conditions. If material characteristics require that the total quantity of water used to secure the required consistency reduces the batch yield (computed on the basis of absolute volumes of the batch quantities used) by more than 2.0%, the Engineer may adjust the proportions to correct the yield. This adjustment will not be a basis for adjustment of the contract unit price.

2. **Air Content:** Use an approved air entraining agent.
   a. For machine-placed pavement, use a target air content of 8% with a tolerance of plus or minus 2% when measured on the grade just prior to consolidation, as determined by Iowa DOT Materials I.M. 318. The target air content may be adjusted by the Engineer based on random tests of the consolidated concrete behind the paving machine. These additional tests will be used to consider the need for a target value change and will not be used in the acceptance decision.
   b. For hand-placed pavement, use a target content for hand finish of 7% with a tolerance of plus or minus 1.5% when measured on the grade and just prior to consolidation, as determined by Iowa DOT Materials I.M.

318.

C. Use of Fly Ash and Ground Granulated Blast Furnace Slag (GGBFS) as Supplementary Cementitious Materials:

1. Mix proportions for the various mixes using fly ash and GGBFS are included in Iowa DOT Materials I.M. 529. The maximum allowable fly ash substitution rate is 20%. Do not use a GGBFS substitution rate of more than 35% by weight (mass). The total supplementary cementitious material substitution rate is not to exceed 40%.

2. If C-SUD or CV-SUD mixes are specified, the maximum allowable Class F fly ash substitution rate is 25% and the maximum Class C fly ash substitution rate is 35%. The maximum combination rate is 20% Class C fly ash and 20% GGBFS.

3. When Type IP or IS cement is used in the concrete mixture, only fly ash substitution will be allowed. Between October 16 and March 15, supplementary cementitious materials will be allowed only when maturity method is used to determine time of opening. Transport, store, haul, and batch fly ash and GGBFS in such a manner to keep it dry.

PART 3 - EXECUTION

3.01 EQUIPMENT

A. Batching and Mixing Equipment:

1. General:
- **a. Weighing and Proportioning Equipment:** Comply with Iowa DOT Article 2001.20.
- **b. Mixing Equipment:** Comply with Iowa DOT Article 2001.21.
- **c. Material Bins:** Involves any structure in which materials are stored. Each part of any bin, including foundations and supports, must be adequate to withstand any stress to which it might be subjected to while in use.

2. Batching:
- a. Ensure the batching plant is Iowa DOT calibrated and approved. Provide copy of current calibrations and approvals.
- b. Coordinate the batch plant operation and batch trucks with the paving operation in order to ensure a steady supply of materials.
- c. Operate the batch plant and trucks to minimize dust, noise, or truck nuisances.

3. Mixing:
- **a. Construction or Stationary Mixer:**
  - 1) Ensure the concrete is uniform in composition and consistency. If this condition is not produced because of the size of the batch, the size of the batch may be reduced or the mixing time increased, or both, until this result is obtained. If non- uniform, corrective action must be taken.
  - 2) Ensure the methods of delivering and handling the concrete are such that objectionable segregation or damage to the concrete will not occur, and they will facilitate placing with a minimum of handling.
- **b. Ready Mixed Concrete:**
  - 1) Ensure the concrete is uniform in composition and consistency. If non-uniform, concrete producers must take corrective action.
  - 2) Ready mixed concrete is defined as concrete proportioned in a central plant and mixed in a stationary mixer for transportation in trucks without agitation, proportioned at a central plant, and only partially mixed in a stationary mixer for transportation and finish mixing in a transit mixer, or

proportioned at a central plant, and then mixed in a transit mixer prior to or during transit.

3) When necessary to add additional mixing water at the site of placement, mix the batch at least an additional 30 revolutions of the drum at mixing speed.

4) Ensure each vehicle in which concrete will be delivered is capable of discharging concrete having a slump not over 2 inches at an overall rate for its entire load of not less than 1.25 cubic yards per minute. Ensure the concrete is delivered at a rate sufficient to maintain a sustained rate of progress of not less than 100 feet per hour for the width and depth of pavement to be placed.

c. **All Methods:** Identify each truck load by a plant charge ticket showing plant name, contractor, project data, quantity, class, time batched, and water added at site.

B. Concrete Delivery Equipment:

1. General:

a. In handling concrete from the mixer to the place of deposit, take care to avoid segregation.

b. When concrete is deposited through a chute, slope the chute to allow concrete to flow slowly without segregation. Place the delivery point of the chute as close as possible to the point of deposit. Keep chutes and spouts clean. Thoroughly flush them with water before and after each run. Discharge the water outside the paving area in an approved concrete washout area.

c. Provide alternate plan for concrete delivery in event of equipment failure.

d. Take concrete samples from material placed on the subgrade or subbase.

2. Concrete Transfer Equipment:

a. Utilize placers, conveyors, buckets, or buggies designed specifically for transporting concrete.

b. Do not allow concrete to free fall into or out of transfer equipment.

c. Meet the requirements of Section 32 13 13, 2.02, B, 2 for air entrainment of the concrete mix and testing for compliance.

3. Concrete Pumps:

a. Do not pump concrete through aluminum conduit or tubing.

b. Use the concrete pump to deliver the material as close to horizontal as possible, keep restrictions and drops to a minimum, and avoid free fall.

c. Meet the requirements of Section 32 13 13, 2.02, B, 2 for air entrainment of the concrete mix and testing for compliance.

d. Sample the first load after pumping a minimum of 3 cubic yards. Sample after each significant change in boom angle.

e. Sample before and after the pump to determine if any changes in the slump and other significant mixture characteristics occur.

f. When sampling at the end of the placement line, take care to ensure that the sample is representative of the concrete being placed from the pipeline. Note: Changes to the placement rate or boom configuration can result in changes in the concrete properties. Typically, the vertical position of the boom results in the greatest potential for air loss while the horizontal position of the boom has the least potential. Location of pumping equipment should be determined so that it is possible to maintain a consistent, low boom angle as much as possible during placement.

g. If air test shows that air entrainment is outside of the allowed range, follow procedure as outlined in Section 32 13 13, 3.07, B.

h. Leaks in the line or pump hydraulics, which would allow air to be added

to the concrete, are prohibited.

C. Concrete Placement Equipment:

1. Consolidating and Finishing Equipment:

a. Use a paving machine that meets all of the following:
   1) Is designed for the specific purpose of placing, consolidating, and finishing concrete pavement.
   2) Develops vertical edges on the pavement.
   3) Is self propelled and equipped with a means for spreading the concrete to a uniform depth before it enters the throat.
   4) Vibrates the concrete to the full width and depth being placed in a single passage. Use vibrating tubes or arms working in the concrete or a vibrating pan operating on the surface of the concrete.
   5) Produces a surface reasonably free of voids and tears.
   6) When the paver is operated on previously placed concrete, prevent damage to the pavement surface.
   7) For slip form pavers, use a paver equipped with automatic horizontal and vertical grade controls.

b. Hand methods utilizing air screeds and vibrating screeds may be used for short pavement runs, cul-de-sacs, driveways, and some intersections.

c. When allowed by the Engineer, use stringless paving equipment capable of providing the same accuracy necessary to comply with the requirements of Section 32 13 13.

d. Use a laser guided screed that meets all of the following:
   1) Designed for the specific purpose of placing and finishing of concrete pavement using a 3-dimensional surface model.
   2) All equipment for laser guided screed, including the guidance system, will meet the project design model tolerances.
   3) Will provide consolidation to full width and full depth of concrete placement. Provide intermediate consolidation by using external hand held vibrators.
   4) Produces a surface reasonably free of voids and tears.
   5) Provide boom-style screed (drive-in screeds are not allowed) with an auger boom, placement head (water spray mechanism not allowed), guidance equipment, and software to produce 3-dimensional surface.
   6) Produces pavement smoothness as specified in Section 32 13 13, 3.07, C.

2. Vibrators for Machine Paving:

a. Consolidate, with a single pass of an approved internal or surface vibrator, the full width and depth of concrete requiring a finishing machine. Operate internal vibrators within a frequency range of 4,000 to 8,000 vibrations per minute. The Engineer may authorize the minimum vibration frequency to be lowered to 3,500 vibrations per minute for particular sections of paving, such as superelevations. Operate surface vibrators within a frequency range of 3,500 to 6,000 vibrations per minute.

b. Avoid operating vibrators in a manner to cause a separation of the mix ingredients, either a downward displacement of large aggregate particles or an accumulation of laitance on the surface of the concrete. When forward motion of the paver is reduced, vibrator frequency may need to be reduced to avoid separation of the mix.

c. If a vibrator fails to operate within the specifications, repair or change the vibrator before the paving begins:
   - The following day, or
   - The same day if the continuous paving that day is stopped at a header or at the end of a session.

d. If two adjacent vibrators fail to operate within the specifications, stop the paving operation and repair or replace the vibrators.
e. Stop vibrators whenever forward motion of the paver is stopped.
f. Set the internal vibrator penetration depth into the concrete pavement to mid slab or as deep as possible while passing above reinforcing steel. Provide an operating position locking device so that no part of the vibrating unit can be lowered to the extent that it will come in contact with reinforcing steel or tie bars while paving.
g. Do not exceed the manufacturer's recommendations for vibrator horizontal spacing. Do not exceed 16 inches from center to center.
h. Mount the longitudinal axis of the vibrator body approximately parallel to the direction of paving. Tilt the trailing end of each vibrator downward to a slope of 10 to 30 degrees below horizontal.
i. Use vibrators that meet or exceed the following specifications at the manufacturer's design frequency of 10,000 vpm:
   1) Amplitude (peak to peak) 0.070 inches.
   2) Centrifugal force 1,200 pounds.

3. **Vibrators for Hand Methods:** Use a vibration rate between 3,500 to 6,000 vibrations per minute, and use an amplitude sufficient to be perceptible on the surface of the concrete more than 12 inches from the vibrating unit.

4. **Hand Finishing Equipment:** Provide all finishing tools necessary for proper finishing of the concrete including straightedges for checking and correcting finished concrete surfaces.

5. **Forms:**
   a. **Rigid Forms:** Steel, minimum thickness of 5 gage, height at least equal to design thickness of pavement with base width at least 6 inches.
      1) Minimum section length of 10 feet, joint connections designed to allow horizontal and vertical adjustment with locking device to hold abutting sections firmly in alignment.
      2) Bracing, support, and staking must prevent deflection or movement of forms.

   b. **Flexible Forms:** Use steel or wood flexible forms for curves with a radius less than 100 feet.
      1) Bracing, support, and staking must prevent deflection or movement of forms.
      2) Ensure that forms used to shape back of curbs at returns have height at least equal to design thickness of pavement and curb height.
      3) Forms must be free from scale and surface irregularities.

6. **Curing Equipment:** Use pressure sprayer capable of applying a continuous uniform film of curing compound. Use equipment with a shield if wind conditions do not allow proper coverage

7. **Concrete Saws:** Use power operated concrete saws capable of cutting hardened concrete neatly.

8. **Joint Sealing Equipment:** Use equipment capable of cleaning the joint and heating and installing sealant in joints according to manufacturer's recommendations.

3.02 PAVEMENT CONSTRUCTION

A. **Removal of Pavement:** Comply with Section 32 13 15, 3.02.

B. Final Subgrade/Subbase Preparation:

1. General:

a. Meet the requirements of Section 31 20 00 for subgrade construction, subgrade treatment, and subbase construction.
b. Trim the subgrade or subbase to the final grade for placement of concrete.
c. Unless otherwise ordered by the Engineer, the subgrade or subbase, at time of placing concrete for concrete pavement, must be in a uniformly moist but not muddy condition to a depth of not less than 1 inch.

2. Subgrade and Subbase Loading:

a. Travel of concrete delivery trucks on a subgrade or subbase must be approved by the Engineer. In such cases, watering of the subgrade or subbase must be limited to just ahead of the paving machine.
b. Enter and exit from side streets to minimize repetitive loading on the subgrade or subbase by concrete trucks.
c. Do not allow loads in excess of the legal axle load on the completed subgrade or subbase.
d. Partially loaded trucks may be required.
e. If subgrade or subbase failure occurs, coordinate the repair with the Engineer.

3. Paving Suspended:

a. Suspend the paving operation where subgrade or subbase stability has been lost.
b. Do not place concrete on a subgrade or subbase that has become unstable, bears ruts or tire marks of equipment, or that is excessively softened by rain until such subgrade or subbase has been reconsolidated and reshaped to correct the objectionable condition.
c. If necessary, scarify to a minimum depth of 6 inches, aerating, and recompacting at no additional cost to the Contracting Authority. Meet the compaction requirements of Section 31 20 00.

4. Maintenance of Subgrade or Subbase: Maintain the completed subgrade or subbase during subsequent construction activities.

C. Surface Fixture Adjustment:

1. Adjust manhole frames and other fixtures within area to be paved to conform to finished surface. Comply with Section 33 42 31 for manhole adjustments and Section 33 14 23 for water fixture adjustments.

2. Clean outside of fixture to depth of pavement before concrete placement.

3. Construct boxouts where allowed for later adjustment of fixtures. See SUDAS Figure 7010.103 for the size and shape of the boxout.

D. Setting of Forms: When forms are used, meet the following requirements.

1. Ensure forms have sufficient strength to support paving operations being used.

2. Set base of forms at or below subgrade elevation with top of forms at pavement surface elevation. With Engineer approval, extra height forms may be used to shape the back of integral curb and edge of pavement; set base at or below subgrade elevation with top of form at top of curb elevation.

3. Place and secure forms to required grade and alignment. Do not vary the top face of the form from a true plane by more than 1/8 inch in 10 feet, and do not vary the

vertical face from a true plane by more than 1/4 inch in 10 feet.

4. If the soil supporting the forms is softened by rain or standing water so that the forms are inadequately supported, or if voids occur under the forms, remove forms. Rework subgrade to proper elevation and density, and reinstall forms.

5. Ensure forms are free of latent concrete and coated with release agent before concrete is placed.

E. Bar and Reinforcement Placement: Ensure bars are clean, straight, free from distortion and rust, and are firmly secured in position as specified in the contract documents. Place all bars in approved storage to prevent damage; do not distribute along the work site except as needed to avoid delay in paving.

1. Tie Bars:

a. Place bars prior to vibration. For slip form paving, tie bars may be installed after vibration, provided the concrete is consolidated around the bars. Bars may be supported by approved chairs or may be placed in position by a machine or method approved by the Engineer.

b. Use approved continuous bolsters with runners to support reinforcement for bridge approach sections. Place the supports transversely across the approach and space them longitudinally no greater than 4 feet. For double reinforced approach sections the top layer of reinforcing may be chaired off the bottom layer of reinforcing using approved continuous high chairs with runners, provided they are positioned directly above the continuous bolsters with runners supporting the bottom layer of reinforcing. Hold epoxy coated reinforcing steel in place with epoxy or plastic coated bar supports and epoxy or plastic coated tie wires.

2. Dowel Bar Assemblies:

a. When dowel bar assemblies are required in the contract documents, accurately place these assemblies as shown. To prevent their movement during subsequent concrete paving operations, securely stake or fasten to the base to line and grade.

b. Do not use assemblies that are damaged prior to placement. If assemblies are damaged after placement, replace prior to paving. Ensure horizontal and vertical alignment of the load transfer bars does not exceed 1/4 inch from parallel to line and grade. Place each assembly so the bars are in a horizontal plane at T/2 ± 1/2 inch.

c. Check the placement of each assembly and the position of the bars within the assembly using a suitable template or other device approved by the Engineer. If the assembly is found to be placed outside of the above tolerances, correct the placement.

d. Cutting the tie wires of the load transfer assemblies is optional.

3. Bar Mats for Reinforced Pavement:

a. When reinforced pavement is specified, assemble bar mats accordingly and firmly fastened together at all bar intersections.

b. Place, secure, latch, and tie bar mats for a continuous mat as specified in the contract documents. Displacement during concrete placement operations is not allowed.

c. Use chairs to ensure proper placement of bar mats.

4. Tie Bars and Dowel Bars in Existing Pavement:

a. When anchoring in existing concrete, use a grout system according to the manufacturer's instructions. Obtain the Engineer's approval for the grout system.

b. For horizontal installations, use either a pressure injection system with mechanical proportioning and mixing, or use encapsulated chemical anchors. Install as follows:
   1) Ensure drilled holes to receive the grout match the dimensions and spacing specified in the contract documents. When not specified in the contract documents, the maximum nominal diameter of the hole must be 1/8 inch larger than the outside diameter of the dowel or bar, or as recommended by the manufacturer. Drill holes for tie bars and dowel bars into the face of the existing pavement at midpoint. To ensure proper horizontal alignment, do not allow any hole misalignments to exceed 1/4 inch in the vertical or horizontal plane. Clean the hole with compressed air immediately prior to placing the grout.
   2) Use a polymer grout to secure the dowels in the existing pavement. Inject the grout into the rear of the hole with pressure. Use sufficient grout so that when the bar to be grouted is placed in position, excess grout will be forced out the front of the hole. Rotate the bar during the insertion process to ensure complete coating with the grouting material. Hand proportioning and mixing is not allowed.
   3) If using grout with approved encapsulated anchors, install according to the manufacturer's recommendations.
   4) Use horizontal installation procedures for vertical or angled installations; however, pourable grouts may be used. Pourable grouts must be mechanically mixed.

F. Concrete Pavement Placement:

1. Use paving machine for all uniform width pavements 8 1/2 feet or more in width and 250 feet or more in length, unless alternate methods are approved by the Engineer. Screeds and laser guided screeds may be used on short pavement runs up to 250 feet.

2. Place, consolidate, and finish the concrete to the full depth and width conforming to the specified crown and cross-section in a single operation.

3. Keep a uniform pile of concrete in front of the paving machine, up to a maximum of 6 to 8 inches above the design surface elevation. Distribute and spread the concrete as soon as placed. A mechanical concrete spreader may be used.

4. Deposit the concrete upon the in-place bars keeping segregation to a minimum.

5. Use shovels, not rakes, to do necessary hand spreading and spading.

6. Do not allow the edges of pavement, including all longitudinal construction joints, to deviate from the line shown on the plans by more than 1/2 inch at any point.

7. If the paving machine operates on adjacent pavement, protect pavement from damage.

8. When placing by hand methods, consolidate the concrete by using vibrating units. Use a definite system or pattern in the operation of the vibrator so the full width of concrete in each linear foot of lane will receive adequate and uniform consolidation. The system and methods of vibrating is subject to approval of the Engineer. Do not use vibrating equipment as a tool for moving concrete laterally.

9. Stringless Paving:
   a. Provide an electronic file identifying x, y, and z coordinates for curbs and

pavement edges, as well as pavement centerline based on project alignments and elevations.

b. Location and elevation of the finished slab should be verified against grade check hubs at 25 foot intervals for the first 100 feet of each days run and at critical locations, such as intakes and through intersections where grades may be flat. The Engineer may waive these requirements if experience has shown compliance with the design elevations.

c. Record each verification check and submit to the Engineer.

d. At the beginning of paving operations on the project or after each modification to the paving machine, verify the paving equipment is calibrated per the manufacturer's recommendations.

G. Integral Curbs: Integral curbs are placed with the pavement in a single paving machine operation; however, hand methods may be allowed for radius, returns, and sections of curb and gutter 100 feet or less in length or in other special sections where mechanical equipment cannot be used.

1. Pave, edge, protect, saw, and cure curb in same manner as pavement.

2. Finish curb as rapidly as finishing operations on pavement permit. Maximum distance behind paving machine is 100 feet.

3. Complete final finish on curbs by hand methods, including the use of a 6 foot straightedge.

4. Check surfaces of curb and gutter with 10 foot straightedge; correct variations greater than 1/8 inch. Ensure top of curb slopes to street when Class A sidewalk will be constructed adjacent to the curb.

5. For drop curb at driveways and where sidewalks intersect streets, use forms to shape the backs of such curbs.

6. When using hand methods for building curb, the following additional requirements will apply:
   a. Remove free water, latency, dust, leaves, or other foreign matter from the slab prior to placing concrete for curb.
   b. Use freshly mixed concrete; do not store concrete in receptacles at side of pavement for use in curb at a later time; do not use concrete requiring retempering.
   c. Consolidate curb concrete to obtain adequate bond with the pavement slab and to eliminate honeycomb in the curb. Avoid disturbing the alignment of forms or the gutter flow line.

H. PCC Railroad Crossing Approach: Construct according to Section 32 13 13 and SUDAS Figure 7010.903. Construct asphalt section according to the full depth patch requirements of Section 32 13 15.

I. Finishing:

1. **Grade and Crown:** Promptly after concrete has been placed and vibrated, strike off the surface to the true section by the screed. Finish the surface true to crown and grade.

2. **Watering the Surface:** The practice of lubricating the pavement surface by sprinkling water by spray, brush, or other methods to afford greater ease in finishing operation is not allowed.

3. **Floats:** Finish surface with wood or magnesium floats; finish from both sides simultaneously if pavement is placed to full width with one pass of paving machine.

4. **Straightedging:**
   a. After the longitudinal floating has been completed and the excess water has been removed, and while the concrete is still plastic, test the pavement surface for trueness.
   b. Immediately fill any depressions found with freshly mixed concrete, struck off, consolidated, and refinished.
   c. Check surface longitudinally while concrete is still plastic; correct any surface deviations greater than 1/8 inch in 10 feet.

5. **Surface Treatment:**
   a. **Drag Surface Treatment:** Unless otherwise specified, texture the finished surface with an artificial turf or burlap drag treatment.
      1) Pull the artificial turf or burlap drag longitudinally over the finished surface to produce a tight, uniform, textured surface, and round the edges in a workmanlike manner.
      2) Remove the artificial turf or burlap drag from the pavement surface at regular intervals and clean with water to remove accumulated concrete from the fabric in order to maintain a consistent finished texture.
      3) When the desired texture is not attained, the Engineer may require the final finish be a broom finish.
   b. **Surface Tining:** When surface tining is specified, use a longitudinal tining. Under special circumstances, when specified in the contract documents, transverse tining may be required.
      1) **Longitudinal:**
         a) Complete longitudinal surface tining using a machine with a wire broom or comb. For small or irregular areas, or during equipment breakdown, hand methods may be used. Use a broom or comb with a single row of tines 1/8 inch (+/- 1/64 inch) in width and uniformly spaced at 3/4 inch intervals. The depth of the grooves must be a minimum of 1/8 inch to a maximum of 3/16 inch in the plastic concrete.
         b) Use equipment with horizontal and vertical string line controls to ensure straight grooves.
         c) Conduct this operation at such time and in such manner that the desired surface texture will be achieved while minimizing displacement of the larger aggregate particles and before the surface permanently sets.
         d) At longitudinal joints, leave a 2 to 3 inch wide strip of pavement surface (centered along the joint) that is not grooved for the length of the joint.

      2) **Transverse:**
         a) If transverse surface tining is required or allowed, use a machine with a wire broom or comb. For small or irregular areas, or during equipment breakdown, hand methods may be used. Use a broom or comb with a single row of tines 1/8 inch (+/- 1/64 inch) in width and randomly spaced from 3/8 inch to 1 5/8 inch with no more than 50% of the spacing exceeding 1 inch. The depth of the grooves must be a minimum of 1/8 inch to a maximum of approximately 3/16 inch in the plastic concrete.
         b) Conduct this operation at such time and in such manner that the desired surface texture will be achieved while minimizing displacement of the larger aggregate particles and before the surface permanently sets.
         c) Where abutting pavement is to be placed, the tining should extend as close to the edge as possible without damaging the edge.
         d) If abutting pavement is not to be placed, do not tine the 6 inch area nearest the edge or 1 foot from the face of the curb.

6. **Edge Finish:** Before the concrete has taken its initial set, finish all edges of the pavement with an 1/8 inch radius edging tool.

7. **Honeycomb Repair:** When paving without forms, fill any honeycombed area immediately with freshly mixed concrete and work into the slab prior to initial set and the application of curing. Failure to do so may prompt the Engineer to declare the work defective and cause it to be removed and replaced at no additional cost to the Contracting Authority.

J. Surface Curing:

1. Apply liquid curing compound in a fine spray to form a continuous, uniform film on the horizontal surface and vertical edges of pavement, curbs, and back of curbs immediately after surface moisture has disappeared, but no later than 30 minutes after finishing. With approval of the Engineer, the timing of cure application may be adjusted due to varying weather conditions and concrete mix properties to ensure acceptable macrotexture is achieved.
   a. Use a white pigment liquid curing compound for concrete not receiving an asphalt overlay. When specified in the contract documents, use a linseed oil solution.
   b. Use a dark-colored curing compound for concrete receiving an asphalt overlay.

2. Apply compound with power sprayer; rate of application not less than 15 square yards per gallon (0.067 gallon per square yard); do not dilute compound. For concrete receiving an asphalt overlay, use a minimum rate for dark-colored cure of 12.5 square yards per gallon (0.08 gallon per square yards).

3. Ensure liquid curing materials are well agitated in the supply drum or tank immediately before transfer to the sprayer. Keep curing materials well agitated during application.

4. Hand operated sprayers may be used for small and irregular areas.

5. If forms are used, apply to pavement edges and back of curbs within 30 minutes after forms are removed.

6. If, due to other operations, the coating is damaged within 72 hours after being applied, immediately re-coat the affected areas. Coating of the sawed surface with curing compound will not be allowed on joints that are to be sealed. When pavement is opened to traffic prior to 72 hours after application of the curing coating, a re-coating will not be required.

K. Construction of Joints:

1. **General:**
   a. Construct joints of the type, dimensions, and at the locations specified in the contract documents. See the SUDAS 7010 figures.
   b. Place longitudinal joints coincident with or parallel to the pavement centerline.
   c. Place all transverse joints at right angles to the centerline and extend the full width of the pavement.
   d. Place all joints perpendicular to the finished grade of the pavement and do not allow the alignment across the joint to vary from a straight line by more than 1 inch.
   e. Exercise care in placing, consolidating, and finishing the concrete at all joints.

2. **Saw Joints:**
   a. Mark joint locations with a string line before sawing.
   b. Begin transverse joint sawing as soon as the concrete has hardened sufficiently

to allow sawing without raveling or moving of aggregate. Saw joints before uncontrolled cracking takes place.

c. Saw all joints in a single cutting operation for a specific joint. Make saw cuts true to line and to the dimensions specified in the contract documents.
d. Discontinue sawing a joint if a crack develops ahead of the saw.
e. Saw longitudinal joints within 24 hours of the concrete being placed.
f. If necessary, continue the sawing operations both day and night.
g. The concrete must be capable of supporting the sawing operations to allow the use of an early green concrete saw.
h. Repair or replace pavement with uncontrolled or random cracking at no additional cost to the Contracting Authority. Use repair methods approved by the Engineer. Repair or replace at the direction of the Engineer.
i. Use wet sawing for dust control when specified in the contract documents.
j. Where boxouts occur in pavement, construct joints as shown on SUDAS Figures 7010.103 and 7010.904.

3. Construction Joints:

a. Place longitudinal and transverse construction joints where specified in the contract documents, at boxouts, and at headers.
b. Locate and place forms for boxouts on grade prior to paving as shown on SUDAS Figures 7010.103 and 7010.904.
c. Construct a Days Work (DW) or a Rigid Tie (RT) transverse construction joint no closer than 5 feet of an existing or planned transverse contraction joint. Construct the DW or RT transverse construction joint if concrete placement is delayed for more than 30 minutes, at planned pavement gaps, or at the end of each day.
d. Finish the edges of the pavement at construction joints with a 1/8 inch radius edging tool.

4. Expansion Joints:

a. Install expansion joints as specified in the contract documents.
b. Prevent movement of or damage to joint assembly when placing concrete; set joint material low enough to clear the finish machine.
c. Construct double width expansion joint in curb over expansion joint in pavement. The backside of the joint must be clear of concrete.
d. Align the expansion joint straight and true. After the mechanical finishing equipment has passed over the joint, check the joint for movement. If movement in excess of 1/2 inch has occurred, immediately correct the installation to its intended position.
e. If joint fillers are assembled in sections, or if joints as a whole are constructed in sections, do not allow offsets between adjacent fillers.
f. Where more than one section is used in a joint, securely lace or clip the sections together.
g. Supplemental vibration equipment is required for proper consolidation of the concrete.
h. After the surface finishing has been completed, finish the edge of the joint with a 1/8 inch edging tool.

L. Joint Sealing:

1. Timing:

a. Unless otherwise allowed or approved by the Engineer, before any portion of the pavement is opened to the Contractor's equipment or to general traffic, clean and seal joints that require sealing.
b. The Engineer may limit the wheel loads and axle loads of equipment operating on the pavement during this operation, if prior to the age and strength specified

in Section 32 13 13, 3.05. Additional tests to determine the pavement strength may be required.

2. **Cleaning:**
   a. For those joints that are not to be sealed, cleaning is not required.
   b. Within 3 hours after a joint has been wet sawed to the finished dimension, flush the wet sawing residue away from the sawed faces using a high pressure water blast operating with a minimum pressure of 1,000 pounds per square inch. Within 3 hours after a joint has been dry sawed to the finished dimension, blow the dry sawing residue from the joint using air compressors that provide moisture and oil free compressed air.
   c. Immediately prior to installation of sealant, clean joints with an air blast. Do not perform sealing until visual examination verifies the joint surfaces appear dry, in addition to being clear of dust and contamination.

3. **Sealing:**
   a. Prepare and install joint sealer in the joint and to the proper level specified in the contract documents and as recommended by the manufacturer.
   b. Heat hot-poured sealers in a thermostatically controlled heating kettle; heat the material to the temperature required for use, but not above that recommended by the manufacturer. After sealing, remove excess sealer from the pavement surface.
   c. Seal joints the same day they are cleaned. Apply sealant only when the joint surfaces appear dry by visual examination.
   d. Place joint sealer only when the pavement and ambient air temperatures are 40°F or above. When near this minimum, additional air blasting or drying time, or both, may be necessary to ensure a satisfactory bond to the joint faces. When this sealer cannot be properly placed due to late fall work, submit a joint construction plan and sealing details to the Engineer for approval before commencing paving. Delay the cleaning, sealing, and, if required, resawing of joints until the following spring. This delay requires the Engineer's approval.
   e. When surface correction is required, repair seals damaged from the corrective work. Joint preparation, cleaning, and sealing may be delayed until after corrective work, provided the pavement is not opened to traffic before corrective work is performed.

M. Pavement Backfill: Following slipform paving operations, place backfill material along the pavement within 48 hours of pavement attaining opening strength or as directed by the Engineer to prevent flow of water and any subsequent damage caused by undermining of the pavement. Prior to placement of full backfill material, construct check dams or other protection as appropriate to ensure no damage to the subgrade and/or subbase occurs.

N. Form Removal:

1. **Timing:**
   a. Remove forms after the initial set of the concrete has taken place.
   b. Remove stakes and forms with care to prevent cracking, spalling, or over stressing concrete. If damage does occur, repairs will be made as required by the Engineer.

2. **Honeycomb Repair:**
   a. When the forms are removed, fill honeycombs with mortar composed of 1 part cement and 2 parts fine aggregate by weight.

b. If the honeycombing is to the degree and nature that it is considered by the Engineer as defective work, remove and replace at no additional cost to the Contracting Authority.

3. **Paving Protection:** In the area adjacent to the curbs and pavement edge, immediately place backfill after the forms are removed. Construct dams or other protection to ensure that no saturation or erosion of the subgrade under or near the pavement occurs. This may include check dams, pumping, etc.

3.03 CURB AND GUTTER CONSTRUCTION (See SUDAS Figure 7010.102)

A. Complete the construction of curb and gutter separate from pavement in the same manner as for pavement in Section 32 13 13, 3.02.

B. Use a paving machine for curb and gutter. For curb and gutter sections less than 250 feet, hand finish methods may be used.

3.04 PAVEMENT PROTECTION

A. Weather Conditions: Do not place concrete when stormy or inclement weather or temperature prevents good workmanship. Temperature restrictions and protection requirements may be modified by the Engineer under unusual conditions.

1. **Cold Weather:**
   a. **Paving:** Do not place aggregates containing frozen lumps, and do not place concrete on a frozen subgrade or subbase. Take all necessary actions to prevent the pavement from freezing.
      1) Concrete mixing and placement may be started, if weather conditions are favorable, when the air temperature is at least 34ºF and rising. At the time of placement, concrete must have a temperature of at least 40ºF.
      2) Stop mixing and placing when the air temperature is 38ºF or less and falling or if the temperature stops rising and does not reach 38ºF.
   b. **Protection:** Prior to applying protection, cure all concrete pavement and curb/gutters, including exposed edges of the pavement and curb. In addition, protect concrete less than 36 hours old as follows:

Night Temperature Forecast	Type of Protection[1]
35°F to 32°F	One layer of burlap for concrete.
31°F to 25°F	Two layers of burlap or one layer of plastic on one layer of burlap.
Below 25°F	Four layers of burlap between layers of 4 mil plastic or equivalent commercial insulating material approved by the Engineer.

[1] Keep protection in place until one of the following conditions is met:
a. The pavement is 5 calendar days old.
b. Opening strength is attained.
c. Forecasted low temperatures exceed 35°F for the next 48 hours.
d. Forecasted high temperatures exceed 55°F for the next 24 hours and subgrade temperatures are above 40°F.

      1) Shut down paving operations in time to comply with protection requirements outlined above. During cold weather, allow more time for finishing and protection. Perform all finishing and covering operations

prior to darkness. Temperature restrictions and protection requirements may be modified by the Engineer.

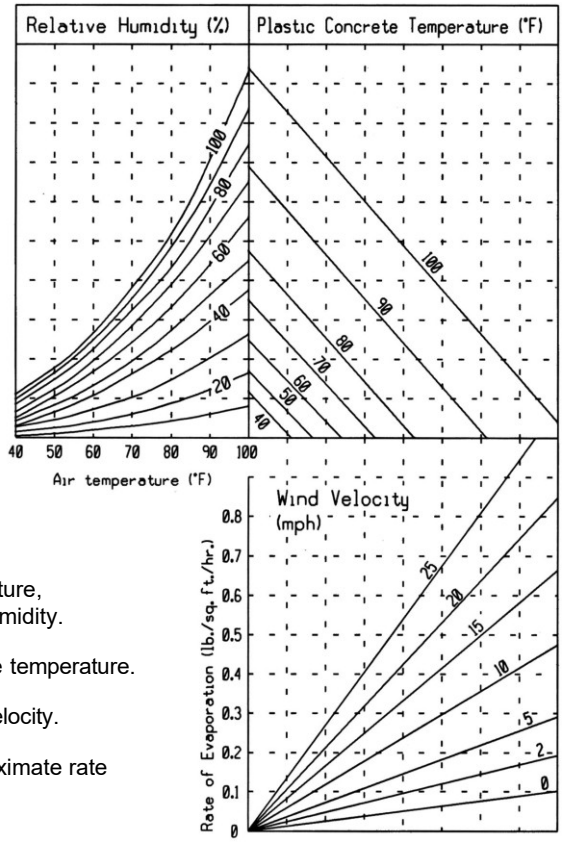
2) Equivalent commercial insulating material approved by the Engineer may be used. This material must be waterproof and have a minimum R value of 1.0. If initial set has not yet occurred, place a layer of burlap on top of concrete prior to placing insulating blankets.
3) Use a method of protection and materials that will maintain the concrete temperature above 40°F.

2. Hot Weather: Hot weather condition is defined as any combination of the following conditions that tend to impair the quality of plastic concrete by accelerating the rate of moisture loss and rate of cement hydration causing thermal shrinkage and resulting in plastic shrinkage cracking:

- High Ambient Temperature
- High Concrete Temperature
- Low Relative Humidity
- High Wind Velocity
- Solar Radiation

a. General:
   1) During hot weather conditions, the Engineer may restrict concrete placement to early morning or evening hours.
   2) During hot weather conditions, advise the Engineer of the results of the theoretical evaporation rate throughout paving operations.
b. Determine the Theoretical Rate of Evaporation: Use the following chart and the National Weather Service's predicted maximum air temperature, relative humidity, and maximum steady wind velocity without gusts, for the date and the location of the paving pour.

Theoretical Rate of Evaporation Chart



To Use this Chart:

1. Enter with air temperature, move up to relative humidity.
2. Move right to concrete temperature.
3. Move down to wind velocity.
4. Move left , read approximate rate of evaporation

c. If the evaporation rate exceeds 0.1 pounds per square foot per hour but is less than 0.3 pounds per square foot per hour, provide the following concrete evaporation protection.
   1) Immediately apply an approved evaporation retarder to the concrete pavement and curbs or increase the surface cure application to 1.5 times the standard specified rate.
   2) Take special precautions to ensure that the forms and subgrade are sufficiently moist or protected to avoid lowering the water content at the pavement/subgrade interface. In hot weather conditions, moisten the subgrade the evening before operations.
   3) Ensure that the time between placing and curing is minimized and eliminate delays.
   4) Moisten concrete aggregates that are dry and absorptive.
   5) Use a fog spray to raise the relative humidity of the ambient air if there is a delay in immediately applying the curing compound.
   6) Minimize solar heat by shading, wetting, or covering concrete chutes or other equipment that comes in contact with plastic concrete.
d. If the evaporation rate is 0.3 pounds per square foot per hour or greater, discontinue placement of concrete.

3. Rain Protection:

a. Have materials available, near the work site, for proper protection of the edges and surface of concrete. Protective material may consist of sheets of burlap or plastic film. Also have planks or other material with suitable stakes that can be used as temporary forms available.
b. If initial set has not occurred, take every precaution necessary to protect the surface texture of the concrete.
c. If so determined by the Engineer, failure to properly protect concrete will constitute cause for removal and replacement of defective pavement.

B. Night Conditions: Perform all finishing and covering operations prior to darkness (half an hour after sunset). Do not commence construction until half an hour before sunrise. Do not place or finish concrete under artificial light, unless approved by the Engineer.

C. Protection from Traffic:

1. General:

a. Protect the new pavement and its appurtenances from traffic, both public and that caused by the Contractor's own employees and agents, at no additional cost to the Contracting Authority. This includes the erection and maintenance of warning signs, lights, barricades, watchmen to direct traffic, and pavement bridges or crossovers.
b. Do not operate equipment with metal tracks, metal bucket blades, or metal motor patrol blades directly on new paving. Do not unload soil or granular materials, including base rock for storage and future reloading directly onto new paving.

2. End of Day's Run:

a. At the end of each day's run and at all side streets, erect and maintain safety barriers and fencing as necessary to protect the pavement from damage.
b. Install safety fences within 1 hour of the completion of finishing and curing operations. Leave fences in place and maintained until the concrete has attained the minimum strength or age.
c. Intermediate safety fences may be required for the purpose of opening the

pavement for access to a side road, side street, or entrance.

3. **Repair of Damages:** At the discretion of the Engineer, and at no additional cost to the Contracting Authority, repair or replace any part of the pavement damaged by traffic or other causes occurring prior to final acceptance of the pavement.

3.05 USE OF PAVEMENT

Time for opening pavement for use is determined by maturity method complying with Iowa DOT Materials I.M. 383 or age and test results. The minimum age and test results needed for opening are shown in Table 7010.01.

Table 7010.01: Minimum Age and Tested Strength of Pavement Before Opening

Class of Mix	Type of Cement	Minimum Age For Opening[1]	Minimum Compressive Strength (psi)	Minimum Flexural Strength Center Point (psi)
C	Type I	7 Days[2]	3,000	500
M	Type I	48 Hours	3,000	500

[1] Opening without testing only allowed upon approval of Engineer
[2] Five calendar days for concrete 9 inches thick or more.

3.06 TRANSPORTATION RESTRICTIONS

A. Do not use concrete transported with continuous agitation when the cement has been in contact with the aggregate more than 90 minutes before it is placed. With the approval of the Engineer, an approved retarding admixture may be used at the rates required in Iowa DOT Materials I.M. 403.

B. Do not use concrete transported without continuous agitation if the period elapsed between the time the concrete is mixed and the time it is placed is greater than 30 minutes. With the approval of the Engineer, an approved retarding admixture may be used at the rates required in Iowa DOT Materials I.M. 403 and the mixed-to-placed time may be extended.

C. Ensure the methods of delivering and handling the concrete are such that objectionable segregation or damage to the concrete will not occur, and concrete placing will occur with a minimum of rehandling.

D. Thoroughly clean the truck compartment in which concrete is transported and flush with water to ensure that hardened concrete will not accumulate. Discharge the flushing water from the truck compartment to the designated discharge point before it is charged with the next batch.

3.07 QUALITY CONTROL

A. Testing: Provide the following material certifications and testing required to be performed by Supplier or Contractor.

Table 7010.02: Material Certifications and Testing

Material or Construction Item	Tests	Applicable Standard[1]	Methods of Acceptance of Sampling and Testing	Field Sampling and Testing	
				Frequency (minimum)	Responsible Party
Fine Aggregates	Gradation	I.M. 302, 306, 336	Cert. Plant Insp.[2]	1/250 CY or min 1/day	Supplier/ Contractor
	Moisture	I.M. 308, 527	Cert. Plant Insp.[2]	1 per 1/2 day	
	Specific Gravity	I.M. 307	Cert. Plant Insp.[2]	1/250 CY or min 1/day	
	Quality	I.M. 209	Approved Source	Prior to use	
Coarse Aggregates	Gradation	I.M. 302, 306, 336	Cert. Plant Insp.[2]	1/250 CY or min 1/day	
	Moisture	I.M. 308, 527	Cert. Plant Insp.[2]	1 per 1/2 day	
	Specific Gravity	I.M. 307	Cert. Plant Insp.[2]	1/250 CY or min 1/day	
	Quality	I.M. 209	Approved Source	Prior to use	
Portland Cement	Quality	I.M. 401	Approved Source	Prior to use	
Fly Ash	Quality	I.M. 491.17	Approved Source	Prior to use	
GGBFS	Quality	I.M. 491.14	Approved Source	Prior to use	
Curing Compound	Quality	Iowa DOT Section 4105	Approved Source	Prior to use	
Joint Sealer	Quality	I.M. 436.01	Approved Source	Prior to use	
Epoxy Dowel Bars and Assemblies	Quality	I.M. 451.03B	Approved Source	Prior to use	
Tie Bars	Quality	I.M. 451	Approved Source	Prior to use	
Plastic Concrete	Air Content	I.M 318, 327	Field Test	1/200 CY or min. 1/day	Engineer
	Slump	I.M. 317	Field Test	1/200 CY or min. 1/day	
	Cylinders	I.M. 315	Field Test	Set of 3/500 CY or two sets/day	
	Beams	I.M. 316, 327, 328	Field Test	Set of 3/500 CY or two sets/day	
	Thickness	----------	Field Test	1/200 CY	
Hardened Concrete	Smoothness	SUDAS 7010, 3.07	Field Test - Straightedge	Project length	
	Smoothness	SUDAS 7010, 3.07	Field Test - Profilograph	Project length	Contractor
	Thickness	SUDAS 7010, 3.07	Field Test	1 core/1000 SY or 3 cores/project	
	Strength	I.M. 383	Maturity Tests[3]	Prior to placement	

[1] Refers to the Iowa DOT Materials I.M.s, Iowa DOT Standard Specifications, or SUDAS Standard Specifications.
[2] Certified plant inspection per Iowa DOT Materials I.M. 527.
[3] The Contractor is responsible for developing the maturity curve for the specified mix, taking maturity readings, and delivering a copy of the results to the Engineer.

B. Air Content:

1. Air content of the concrete will be evaluated according to Iowa DOT Materials I.M. 318 and 327.

2. When a test result is outside the tolerance for the target air content, the contractor will be notified immediately. An air test will then be immediately run behind the paver to aid in identifying the limits of the non-complying air. A test result between 5% and 8% behind the paver will be considered complying. This test will represent all concrete from the back of the paver back to the last documented complying test. Make immediate adjustments to the mix production and placement process to bring

the air content back within tolerance. Do not use succeeding loads below the lower target air content tolerance by more than 0.5%. Each subsequent load will be tested until air content is within tolerance for two consecutive loads. For all incorporated, non-complying concrete that is out of tolerance, the Engineer will determine if removal and replacement is required or if a price adjustment, according to Table 7010.03, will be applied.

Table 7010.03: Concrete Air Content Price Adjustments

Air Content Range			% Payment of Unit Price
Minimum		**Maximum**	
1.1*	and	below	0%
0.6	to	1.0*	50%
0.1	to	0.5*	75%
Low air tolerance limit			100%
Target			100%
High air tolerance limit			100%
0.1	to	0.5**	95%
0.6	to	1.0**	85%
1.1	to	1.5**	75%
1.6	to	2.0**	60%
2.1**	and	above	0%

*Air content deviation below the acceptable limits
** Air content deviation above the acceptable limits

C. Pavement Smoothness: Evaluate pavement smoothness for all PCC pavement and overlay surfaces.

1. **Straightedge:** The Engineer will check PCC pavement surfaces with a 10 foot straightedge placed parallel to the centerline. Areas showing high spots of more than 1/4 of an inch in 10 feet will be marked. Complete surface corrections according to the procedures in Iowa DOT Section 2316 to an elevation where the area or spot will not show surface deviations in excess of 1/8 inch when tested with a 10 foot straightedge. Surface corrections will be completed at the direction of the Engineer with no additional cost to the Contracting Authority.

2. **Profilograph:**
   a. If specified in the contract documents, comply with Iowa DOT Section 2316 to measure pavement smoothness with a profilograph.
   b. Evaluate according to the smoothness requirements of Table 7010.04 and make surface corrections and price reductions. Surface corrections will be completed with no additional cost to the Contracting Authority. No incentive for pavement smoothness will be made.

Table 7010.04: Pay Factor if Profilograph Used

Segment Index (inch/mile)	Pay Factor
0 - 22.0	100%
22.1 - 30.0	97%
30.1 and over	Grind as directed by Engineer

   c. Smoothness measurements will be suspended for structures and through intersections.

D. Pavement Thickness:

1. At locations determined by the Engineer, cut samples from the pavement by drilling with a core bit that will provide samples with a 4 inch outside diameter. Restore the surface by tamping low slump concrete into the hole, finishing, and texturing. The Engineer will witness the core drilling, identify, and take possession of the cores. The Engineer will determine the core locations, measure the cores, and determine the thickness index according to Iowa DOT Materials I.M. 346 and 347, except as modified as follows:
   a. For regular or irregular shaped areas, use a lot size of 1,000 square yards. Include remnants less than 500 square yards in the last lot and remnants greater than 500 square yards in a separate lot. Take a minimum of three cores per project.
   b. For any core with a deficiency greater than 0.15 inch, take two additional cores in that pavement lot and use the average of the three cores.

2. Coring of pavement or other work for thickness determination may be waived by mutual agreement for sections of the same design thickness less than 2,500 square yards.

3. Based on the thickness index determined by the Engineer, the pavement payment will be as shown in Tables 7010.05 and 7010.06.

4. If the thickness index deficiency is greater than 0.51 for pavements thinner than 9 inches or 0.91 for pavements 9 inches or thicker, the Engineer will study the extent and severity of the deficiency of the pavement areas. The Engineer will require one of the following based on a review on the level of deficiency, the amount of the payment penalty, and the estimated reduction in the design life of the deficient pavement:
   a. Removal and replacement of the deficient areas with pavement complying with the contract documents at no additional cost to the Contracting Authority.
   b. Completion of an agreement that provides a combination of an extended guarantee period and payment penalty and allows the deficient pavement to be left in place.

Table 7010.05: Pay Factor for PCC Pavement for Design Thickness less than 9"

Thickness Index Range	Percent Payment
More than 0 to -0.15	100
-0.16 to -0.25	95
-0.26 to -0.50	85
-0.51 or less	As determined by the Engineer

Table 7010.06: Pay Factor for PCC Pavement for Design Thickness 9" or Greater

Thickness Index Range	Percent Payment
More than 0.00 to -0.15	100
-0.16 to -0.20	99
-0.21 to -0.25	98
-0.26 to -0.30	97
-0.31 to -0.35	96
-0.36 to -0.40	95
-0.41 to -0.45	94
-0.46 to -0.50	93
-0.51 to -0.55	92
-0.56 to -0.60	91
-0.61 to -0.65	90
-0.66 to -0.70	89
-0.71 to -0.75	88
-0.76 to -0.80	87
-0.81 to -0.85	86
-0.86 to -0.90	85
-0.91 or less	As determined by the Engineer

E. Defects or Deficiencies: Remove and replace or repair pavement containing excessive cracks, fractures, spalls, or other defects at no additional cost to the Contracting Authority. The method of replacement or repair will be determined by the Engineer.

END OF SECTION

SECTION 32 13 14

SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Removal of Sidewalks, Shared Use Paths, and Driveways

B. Installation of Sidewalks, Shared Use Paths, and Driveways

1.02 DESCRIPTION OF WORK

A. Remove existing sidewalks, shared use paths, and driveways.

B. Install shared use paths.

C. Install sidewalk.

D. Install driveway.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following:

A. PCC mix design.

B. Asphalt mix design.

C. Brick source, absorption, compressive strength; samples of brick showing texture and color.

D. Submit type and color of detectable warnings.

E. Results of required testing.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions, as well as the following:

A. Portland Cement Concrete: See Section 32 13 13.

B. Asphalt: See Section 32 12 00.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 CEMENT CONCRETE

A. Use Class A or C concrete for sidewalks and driveways and Class C for shared use paths with materials complying with Section 32 13 13. Use coarse aggregate of Class 2 durability or better.

B. Comply with the following for PCC mixes for sidewalks, shared use paths, and driveways unless otherwise approved by the Engineer.

Table 7030.01: PCC Mixes

	Machine Finish	Hand Finish
Type of Concrete	Class A or C	Class A or C
Slump Minimum	1/2 in.	1/2 in.
Slump Maximum	2 1/2 in.	4 in.
Percent Air Content		
• Target	7%	7%
• Minimum	6%	6%
• Maximum	8 1/2%	8 1/2%

2.02 ASPHALT

Comply with Section 32 12 00 for mix design.

A. Use Low Traffic (LT), 1/2 inch or 3/8 inch mix.

B. For shared use paths adjacent to pavement that also functions as the pavement shoulder, use Low Traffic (LT), 1/2 inch mix.

C. Use asphalt binder complying with Section 32 12 00 with a performance grade of PG 58-28S or 58-34S.

2.03 BRICKS/PAVERS

A. Clay Bricks: Use 8 inch by 4 inch by 2 1/4 inch thick clay paving bricks with straight edges or a maximum chamfer of 1/8 inch manufactured to comply with ASTM C 902, Class SX, Type I. Color selection and surface texture as approved by the Engineer.

B. Concrete Pavers: Supply as specified in the contract documents. Use pavers with straight edges or a maximum chamfer of 1/8 inch.

2.04 SETTING BED FOR BRICKS/PAVERS

A. Asphalt:

1. **Mixture:** Proportion mix using 7% asphalt binder and 93% fine aggregate. Apportion each ton in the approximate ratio of 145 pounds asphalt binder to 1,855 pounds sand. Maintain mix temperature at approximately 250°F during placement.

2. **Asphalt Binder:** Use asphalt binder complying with Section 32 12 00 with a performance grade of PG 58-28 or 64-22.

3. **Fine Aggregate:** Use clean, hard sand with durable particles free from adherent

coating, lumps of clay, alkali salts, and organic matter. Use sand that is uniformly graded from coarse to fine with all passing the No. 4 sieve and meeting AASHTO T 27.

2.04 SETTING BED FOR BRICKS/PAVERS (CONTINUED)

A. Pre-mixed High Performance Cold Mix: If allowed, substitute a pre-mixed high performance cold mix product for the asphalt setting bed generally meeting the asphalt mixture requirements noted above.

B. Sand: Use clean, hand sand free from deleterious materials. Use sand meeting ASTM C 33 that is uniformly graded with all passing the No. 4 sieve and 3% or less passing the No. 200 sieve.

2.05 NEOPRENE MODIFIED ASPHALT ADHESIVE FOR BRICKS/PAVERS

A. Mastic (Asphalt Adhesive):

Solids (Base):	74% to 76%
Pounds per Gallon:	8 to 8 1/2 pounds
Solvent:	Mineral spirits with a flash point above 100° F

B. Base (2% Neoprene, 10% Asbestos-free Fiber, 88% Asphalt):

Melting Point:	200° F minimum according to ASTM D 36
Penetration:	23 to 27 according to ASTM D 5
Ductility:	1250 mm minimum according to ASTM D 113 @ 25° C, and a rate of 50 mm/minute

2.06 BRICK/PAVER JOINT FILLER

Dry sand-cement mixture consisting of one part masonry cement complying with ASTM C 91 and three parts sand complying with ASTM C 144 and passing the No. 16 sieve. Provide colored cement as specified in the contract documents.

2.07 DETECTABLE WARNINGS

Use manufactured detectable warning panels with a non-slip surface and raised truncated domes. Comply with the Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (also known as PROWAG) for contrast and dimension requirements. Also comply with Iowa DOT Materials I.M. 411.

2.08 GRANULAR DRIVEWAY SURFACING

Class A crushed stone or Class C gravel complying with Iowa DOT Section 2315.

2.09 ISOLATION AND EXPANSION JOINT SEALANT

Use a polyurethane, self-leveling sealant complying with ASTM C 920. Application temperature range of 40 to 120°F. Minimum elongation 700%.

PART 3 - EXECUTION

3.01 REMOVALS

A. Remove sidewalks, shared use paths, driveways, bricks, and curbs to the removal limits specified in the contract documents.

B. Saw pavement full depth in straight lines to the specified removal limits.

C. Remove to the specified removal limits without damage to adjacent property, trees, utilities, or pavement that are to remain in place.

D. Salvage and stockpile all bricks removed.

E. Grind or saw existing curbs at locations specified in the contract documents to install sidewalks, shared use paths, and driveways.

F. Dispose of rubble and debris resulting from removal operations.

3.02 SUBGRADE PREPARATION

A. Shared Use Paths:

1. **Subgrade Preparation:** Comply with Iowa DOT Section 2109.

2. **Special Subgrade Preparation:**
   a. Construct subgrade to final elevation.
   b. Scarify and mix the top 6 inches of subgrade material to a width equal to that of the proposed pavement, plus 2 feet on each side.
   c. Compact loose subgrade material with Type A compaction complying with Section 31 20 00.
   d. Proof roll compacted subgrade according to Section 31 20 00.

B. Sidewalks and Driveways:

1. Remove all vegetation and roots from ground surface.

2. Construct grade to final subgrade elevation.
   a. Cut area: Remove all material that will be displaced by the sidewalk.
   b. Fill area: Scarify the surface to be covered with embankment to a depth of at least 6 inches and compact. Construct embankment in lifts of 6 inches or less and compact each lift. Tamp surface with a mechanical tamper until firm and unyielding.

3. Remove all soft, spongy, or yielding spots and fill the void with suitable backfill material.

3.03 ADJUSTMENT OF FIXTURES

A. Adjust fixtures to conform to the finished pavement surface. Cooperate and coordinate with the utility agency to ensure proper fixture adjustment.

B. Comply with Sections 33 14 23 or 33 42 31 as appropriate.

3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

Construct sidewalks and shared use paths to the line and running slope specified in the contract documents. Unless otherwise specified in the contract documents, the maximum cross slope is 2.0%, target cross slope is 1.5%, and minimum cross slope is 1.0%.

A. Form Setting: Comply with Section 32 13 13 with the following additional requirements and exceptions.

1. Slip form paving equipment may be allowed in lieu of setting forms, if approved by the Engineer.

2. Wood forms are allowed.

3. Use of an automated subgrade trimmer is not required.

4. Set forms true to line and grade and hold them rigidly in place by stakes placed outside the forms and flush with or below the top edge of the forms.

5. Measure or stake as required to construct project elements. If either of the following is met and construction survey is not a bid item, the Contracting Authority will 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%.

   If adequate tolerances are contained in the design, the Contracting Authority will not verify the form work for the construction of sidewalks or shared use paths. If field adjustments cause changes that will bring the facility into the range of tolerances shown above, notify the Engineer prior to construction.

B. Concrete Pavement Placement:

1. **Shared Use Paths:** Comply with Section 32 13 13.

2. **Sidewalk:**
   a. Maintain moist subgrade in front of paving operation
   b. Deposit concrete on the subgrade as required to minimize rehandling to prevent segregation.
   c. Hand spread with shovels, not rakes.
   d. Place concrete as required to slightly overfill the space between the forms.
   e. For thicknesses less than 5 inches, consolidate by knifing with hand tools. When thickness is 5 inches or greater, consolidate with hand or mechanical vibrators meeting Section 32 13 13. Smooth by use of a straightedge.
   f. Do not contaminate freshly mixed concrete with earth or other foreign materials.

3. **Driveways:** Comply with SUDAS Figures 7030.101 and 7030.102 and Section 32 13 13. The use of a paving machine is not required.

C. Finishing:

1. **Shared Use Paths and Driveways:**
   a. Comply with Section 32 13 13.
   b. Provide a burlap drag or broom finish.

2. **Sidewalks:**
   a. Use a wood float to depress the large aggregate and create a dense surface.
   b. Allow concrete to set until all shine has disappeared from the surface.
   c. Smooth with a metal trowel until surface is free from defects and blemishes.
   d. Construct joints by sawing or by using a jointer or groover tool.
   e. 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.

f. Brush with a soft broom at right angles to the side forms to provide a non-skid surface.

D. Curing: Cure according to Section 32 13 13.

E. Form Removal: Comply with Section 32 13 13.

F. Jointing:

1. Construction Joints:

a. Locate construction joints 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. Transverse Contraction Joints:

a. Shared Use Paths:

1) Space transverse joints equal to the width of the shared use path, or as specified in the contract documents.

2) Saw contraction joints according to Section 32 13 13.

b. Sidewalks and Driveways:

1) Space sidewalk contraction joints equal to the width of the sidewalk.

2) Space driveway contraction joints so panel length does not exceed 12 feet.

3) 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 1/8 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. Longitudinal Contraction Joints:

a. Shared Use Paths and Sidewalks: Saw joint to 1/8 inch wide and to a depth of 1/3 the pavement thickness.

b. Driveways:

1) Space longitudinal contraction joints so panel width does not exceed 12 feet.

2) Form longitudinal 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 with a 1/8 inch blade saw to a depth of 1/3 the pavement thickness. Use a straightedge if joints are sawed with a hand-held saw.

4. Isolation Joints:

a. Install isolation joints where sidewalks, shared use paths, or driveways abut roadway pavement, parking lots, buildings, and structures.

b. For a sidewalk constructed with a driveway, install an isolation joint on the property side of the sidewalk and a 'C' or 'E' joint on the street side of the sidewalk.

c. Install a 1/2 inch or 3/4 inch thick strip of preformed resilient joint material, according to Section 32 13 13, to the full depth of concrete. Trim any isolation joint material protruding above the finished work to the level of the abutting concrete.

d. If the isolation joint is to be sealed, place the preformed material 1/2 inch below the level of the abutting concrete.

5. Joint Sealing:

a. Do not seal construction or contraction joints in sidewalks, shared use paths, or driveways.

b. If sealing of expansion or isolation joints is specified in the contract documents, trim preformed joint material to a depth of 1/2 inch below the concrete surface. Ensure the joint is clean and dry. Install joint sealant per manufacturer's recommendations.

3.04 ASPHALT SHARED USE PATHS AND DRIVEWAYS

Construct sidewalks and shared use paths to the line and running slope specified in the contract documents. Unless otherwise specified in the contract documents, the maximum cross slope is 2.0%, target cross slope is 1.5%, and minimum cross slope is 1.0%. Comply with Section 32 12 00.

3.05 BRICK/PAVER SIDEWALKS WITH A PAVEMENT BASE

A. General:

1. Comply with SUDAS Figure 7030.203.

2. Use a cross-section and patterns as specified in the contract documents or approved by the Engineer.

3. Do not use broken bricks or materials with stained faces in the paving areas.

4. Construct the concrete base to comply with PCC sidewalk construction specifications.

B. Setting Bed:

1. Place 3/4 inch depth control bars on the base to serve as guides for the striking board. Shim depth control bars as necessary to adjust bedding thickness and to ensure the top surface of pavers will be at the required finished grade.

2. Place bedding material between the parallel depth control bars. Pull striking board over bars several times. After each pass, spread fresh bedding material over low or porous spots to produce a smooth and even setting bed. After placing and smoothing each section, advance depth control bars to next section. After removal of depth control bars and shims, carefully fill any depressions that remain.

3. While still hot, roll the asphalt setting bed with a power roller to a nominal depth of 3/4 inch.

4. Ensure the joints in the concrete base do not project through the asphalt setting bed.

5. Apply neoprene modified asphalt adhesive over the top surface of the cooled asphalt setting bed with notched trowel with serration not exceeding 1/16 inch. Allow adhesive to dry to the touch before placing pavers.

C. Weep Holes:

1. Install 2 inch diameter, 12 inch long, PVC pipe even with the top of the asphalt setting bed at the locations identified on the plans.

2. Fill pipe with 3/4 inch clean rock and cover weep hole with engineering fabric.

3. Install minimum of 12 inch deep and 12 inch wide reservoir of clean 3/4 inch rock around the pipe below the PCC sidewalk base or extend the rock reservoir to the pavement subdrain.

D. Bricks/Pavers:

1. Place the bricks/pavers by hand in straight courses with hand tight joints and uniform top surface.

2. Sweep dry joint filler into joints until the joints are completely filled.

3. Fog surface lightly with water to cure cement.

4. Clean any cement stains from bricks/pavers surface. Remove stains from other concrete surfaces.

E. Protection: Protect newly laid bricks/pavers at all times using panels of plywood. Panels can be advanced as work progresses; however, keep the plywood protection in areas that will be subjected to movement of materials, workers, and equipment. Take precautions in order to avoid depressions and protect brick/paver alignment until cured and ready for pedestrian or vehicle traffic.

3.06 DETECTABLE WARNING INSTALLATION

Set detectable warning panels in fresh concrete according to the manufacturer's recommendations and SUDAS Figure 7030.210.

3.07 SLOPE AND SMOOTHNESS TESTING

A. Slope for Sidewalks, Curb Ramps, Turning Spaces, and Shared Use Paths:

1. Complete slope measurements and documentation according to Iowa DOT Materials I.M. 363.

2. At no additional cost to the Contracting Authority, remove and replace all sections not meeting PROWAG requirements as detailed in SUDAS Design Manual Section 12A-2.

B. Smoothness for Shared Use Paths and Driveways:

1. Check finished surface with a 10 foot straightedge placed parallel to the centerline. Mark areas showing high spots of more than 1/4 of an inch in 10 feet.

2. If directed by the Engineer, correct marked areas by grinding down with an approved grinding tool to an elevation where the area will not show deviations in excess of 1/8 inch.

3.08 GRANULAR DRIVEWAY SURFACING

Comply with Iowa DOT Section 2315.

3.10 CLEANING

A. Remove all litter and construction materials or tools immediately after the end of the curing period.

B. Remove excess dirt from the site.

C. Broom clean completed sidewalks, shared use paths, and driveways.

3.11 MATERIAL TESTING

A. General: When testing is specified in the contract documents as the Contractor's responsibility, provide testing using the services of an independent testing laboratory approved by the Engineer.

B. Concrete Compression Tests: When the concrete volume placed on a single day exceeds 20 cubic yards, comply with the following test requirements. When deficiencies are encountered, comply with Section 32 13 13.

1. Prepare at least two test cylinders per day.

2. If the concrete volume placed on a single day exceeds 200 cubic yards, prepare two test cylinders for each 200 cubic yards placed.

3. Provide 7 and 28 calendar day tests according to ASTM C 39. Minimum compressive strength is 2,000 psi at 7 days and 4,000 psi at 28 days.

C. Asphalt Density and Thickness Tests: When the area of asphalt placed on a single day exceeds 100 square yards, comply with the following test requirement. When deficiencies are encountered, comply with Section 32 12 00.

1. Prepare at least two cores per day.

2. If the area of asphalt placed on a single day exceeds 2,000 square yards, prepare two cores for each 2,000 square yards placed.

3.12 SIDEWALK AND CURB RAMP COMPLIANCE

Compliance with cross slopes and grades, as well as all other elements, for sidewalks and curb ramps is crucial. If the construction cannot be completed as specified in the contract documents, it may be necessary to adjust slopes within the accepted legal limitations. Contact the Engineer prior to placement of the concrete if changes from the values specified in the contract documents are being made.

END OF SECTION

SECTION 32 17 23
PAVEMENT MARKINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Permanent Pavement Markings, Symbols, and Legends

B. Removable Pavement Markings, Symbols, and Legends

C. Temporary Delineators

D. Raised Pavement Markers

E. Removal of Pavement Markings, Symbols, and Legends

F. Grooves Cut for Pavement Markings, Symbols, and Legends

1.02 DESCRIPTION OF WORK

A. Furnish, install, maintain, and remove permanent or temporary pavement markings, temporary delineators, and raised pavement markers, such as for:

1. Diversions and on-site detours where the need for this work is anticipated as part of the traffic control plan to accommodate traffic during construction.

2. Replacing markings obliterated during construction activities on roads open to public traffic.

3. Changing markings on roads open to public traffic where the necessary changes result from staged construction.

4. Replacing markings that are obsolete.

5. Marking newly completed pavement surfaces.

6. Replacing existing markings that have faded or worn away on roads open to public traffic.

B. Permanent pavement markings are intended to remain in place after the project is completed. Temporary markings are designated for removal, will be obliterated during construction, or require changes during construction.

C. Diversions are installations or modifications for the transfer of traffic on four lane or wider roadways to lanes that would normally carry traffic in the opposite direction. Diversions provide for continuous but restricted traffic flow from both directions for divided highways. Diversions usually include crossovers.

D. On site detours are temporary roadways specifically constructed to accommodate traffic during construction.

1.03 SUBMITTALS

Comply with General Provisions as well as the following:

A. Submit a list of pavement marking materials proposed for use on the project.

B. Provide the Engineer with a copy of the manufacturer's recommendations for applying the pavement marking.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide pavement marking materials complying with Iowa DOT Sections 2527 and 4183.

B. Pavement marking materials include:

1. Wet, retroreflective removable tape markings

2. Painted Pavement Markings:
   a. Waterborne and solvent based paint pavement markings
   b. Durable paint pavement markings
   c. High-build waterborne paint pavement markings
   d. Methyl methacrylate (MMA), two component paint

3. Regular marking tape

4. Temporary delineators

5. Raised pavement markers

6. Channelizer markers

7. Preformed polymer tape

8. Removable, nonreflective preformed tape

9. Profiled pavement marking tape

10. Intersection marking tape

PART 3 - EXECUTION

3.01 EQUIPMENT

A. General: Utilize equipment complying with Iowa DOT Section 2527.

B. Pavement Marking Equipment:

1. Capable of placing two lines simultaneously with either line in a solid or intermittent pattern in yellow or white.
2. Capable of applying reflectorizing spheres at the required rate with a pressurized system.
3. All guns in full view of the operator at all times.
4. Equipped with a metering device to register the accumulated length of each gun, each day.
5. Designed so the pressure gages of each proportioning pump are visible to the operator at all times during operation to monitor fluctuations in pressure.
6. Capable of applying paint without dilution.

C. Pavement Marking Removal:

1. Operates without the release of dust.
2. Recovers all removed material.
3. Includes a waste collection and transfer system and for dry wastes, ensure the system incorporates high-efficiency particulate absorption (HEPA) methods and equipment.

D. Pavement Grooving:

1. Utilize grooving equipment with stacked diamond cutting heads mounted on a floating head with controls capable of providing uniform depth and alignment.
2. If pavement is grooved by dry cutting, provide equipment that is self vacuuming.
3. When requested, make available to the Engineer a caliper, depth gage, or depth plate, for use in measuring groove depth.

3.02 CONSTRUCTION

A. General:

1. Comply with the requirements of the MUTCD for traffic control during all pavement marking operations.
2. Install all pavement markings according to the product manufacturer's published recommendations.

3. Ensure the following for all painted and taped pavement markings:
   a. Uniform thickness
   b. Uniform distribution of reflectorizing spheres throughout the line width
   c. Line widths as specified, with a tolerance of ± 1/4 inch for 4 inch lines and ± 1/2 inch for wider lines
   d. Symbols and Legends are visually proportional to contract documents with an out-to- out tolerance of ± 6 inches
   e. Markings have sharp edges and cutoffs at the ends

4. For all painted markings:
   a. Apply the paint without dilution
   b. Apply reflectorizing spheres immediately to the wet-paint with a pressurized system

5. For all tape products, follow the manufacturer's recommendations for surface dryness, primers, adhesives, and other surface preparation requirements. Unless otherwise specified by the tape manufacturer, meet the following test for determining surface dryness before applying the tape:
   a. In an area of direct sunlight where the tape will be applied, place an 18 inch by 18 inch piece of polyethylene (a green or black garbage bag may be used). There should not be any holes or tears in the polyethylene.
   b. Tape down all the edges of the polyethylene sheet to seal all the edges and not allow any air movement to get under the polyethylene.
   c. Firmly tamp the tape using the tamper cart or by foot tamping.
   d. Allow 20 to 25 minutes for the polyethylene to be exposed to the direct sunlight.
   e. Remove the polyethylene from the road surface. If no moisture is present on the underside of the polyethylene or on the road surface, the tape can be applied.
   f. If any moisture is present, allow another hour to pass and repeat the test until no moisture is found.

B. Surface Preparation: For all pavement markings, ensure the pavement surface is dry and free from dirt, dust, oil, curing compound, and other contaminates that may interfere with markings properly bonding to the surface.

1. Clean surface to at least 1 inch wider than the anticipated marking.

2. Unless otherwise specified, sweep the pavement surface with a rotary broom or street sweeper.

3. Shoot an air blast on the pavement surface immediately prior to placing the new marking. The air blast is not intended to remove large amounts of dust, but only the residue that might be left from the removal and cleaning operation.

4. When pavement markings are placed on newly constructed PCC pavements, remove the existing curing compound film from horizontal surfaces in these locations. Curing compound film need not be removed from curbs or other vertical surfaces. Remove the curing compound in a manner that does not damage the underlying pavement.

C. Painted Pavement Markings:

1. **Waterborne and Solvent Based Paint:** Apply paint and reflectorizing spheres at the nominal rates shown in the following tables.

Table 8020.01: Waterborne Paint Application Rates

Line Width	Wet-Film Thickness	Paint	Reflectorizing Spheres
4”	14 mils	343 ft of solid line per gallon of paint	9.0 lb/gal

Table 8020.02: Solvent-based Paint Application Rates

Line Width	Wet-Film Thickness	Paint	Reflectorizing Spheres
4”	16 mils	300 ft of solid line per gallon of paint	9.0 lb/gal

2. **Durable Paint Pavement Markings:**
   a. Use the same binder thickness as applied on the National Transportation Product Evaluation Program (NTPEP) deck with a tolerance of 10%.
   b. Bead application rate is at the discretion of the Contractor.
   c. Construct durable pavement markings to comply with the following retroreflectivity requirements when tested according to Iowa DOT Materials I.M. 483.04.

Table 8020.03: Minimum Coefficient of Retroreflected Luminance

White line, symbols, and legends	300 mcd/ft^2/ft-cdl.
Yellow line	200 mcd/ft^2/ft-cdl.

3. **High-Build Waterborne Paint Pavement Markings:**
   a. Provide binder thickness of 0.022 inches $\pm$ 0.0025 inches.
   b. Bead application rate is at the discretion of the Contractor.
   c. Construct high-build waterborne paint pavement markings to comply with the following retroreflectivity requirements when tested according to Iowa DOT Materials I.M. 483.04.

Table 8020.04: Minimum Coefficient of Retroreflected Luminance

White line, symbols, and legends	300 mcd/ft^2/ft-cdl.
Yellow line	225 mcd/ft^2/ft-cdl.

D. Marking Tape: If grooving is specified, do not inlay the tape into hot HMA.

1. **Inlaid:** When the installation of preformed polymer pavement marking material or profiled pavement marking tape is in conjunction with placement of HMA, inlay the tape by positioning it on the HMA prior to the final rolling. Perform the installation of the tape according to the manufacturer's recommendations.

2. **Grooved:** When grooving is specified, install marking tape in recessed groove according to the manufacturer’s recommendations.

E. Temporary Delineators: Mount temporary delineators 4 feet above the pavement on delineator posts. Install posts 2 feet from the outside edge of the shoulder at locations specified in the contract documents.

F. Raised Pavement Markers: Ensure markers continually exposed to traffic do not extend more than 3/4 inch above the pavement surface.

G. Pavement Marking Layout and Location:

1. **Permanent Markings:** Place all lines within 2 inches of reference location. The location of edge lines may be referenced to the pavement edge. The locations of other longitudinal lines may be referenced to accurately locate longitudinal joints. Where reference locations do not exist or are not reliable, locate the lines as follows:
   a. For straight or nearly straight lines, reference the locations to a string line set between marking line points.
   b. For curves, reference the locations to closely spaced marking line points. For sharp curves, a spacing of 10 feet may be required.
   c. Other equally effective systems the Engineer approves.

2. **Temporary Markings:** The location of temporary pavement marking will be specified in the contract documents or as directed by the Engineer to maximize the effectiveness of the traffic control plan.

H. Removal of Pavement Markings:

1. **Staging:**
   a. At the start of construction and at each change in staging, remove all existing pavement markings that conflict with the pavement marking plan.
   b. Prior to final pavement marking, remove all temporary pavement markings.
   c. The Engineer may designate other pavement markings for removal to maximize the effectiveness of the traffic control plan.

2. **Process:**
   a. Remove existing painted pavement markings so that 90% or more of the pavement is visible. Tightly adhering markings may remain in the bottom of the tining and other depressions on the pavement surface, but ensure they are not visible to the motorist during daytime or nighttime. Remove tape markings according to the manufacturer's recommendations. Ensure removal processes do not cause functional damage to the transverse or longitudinal joint sealant materials.
   b. Conduct pavement marking removal operations in a manner so that the finished pavement surface is not damaged or left in a pattern that may mislead or misdirect the motorist. When the operations are completed, power broom the pavement surface. Remove all marking removal debris from the pavement surface before the pavement is open to public traffic.
   c. Perform pavement marking removal to a width no less than the width of the existing or new pavement markings plus 1 inch. Remove the entire area of the existing symbol, legend, or marking in a rectangular shape so no directionality may be observed from the removed symbol, legend, or marking.
   d. Removal of pavement markings may be performed by vacuum blasting, vacuum dry grinding, wet grinding, shot blasting, or high pressure water blasting. Open abrasive blasting or dry grinding without containment is not allowed.

I. Markings Obliterated During Construction:

1. On sections of pavement open to traffic, place pavement markings where construction or traffic operations have obliterated existing markings.

2. Replace markings obliterated during construction within 3 calendar days after the operation that obliterated the markings has been completed. At intersections with Iowa DOT highways, replace all obliterated edge lines, lane lines, no passing zones, and centerlines prior to opening to traffic.

3. Place symbols and legends within 3 calendar days from the day the road is open to traffic.

J. Grooving for Pavement Markings: When specified in the contract documents, place pavement markings in a groove cut into the pavement surface. Dry or wet cut the groove in a single pass.

1. **Groove Depth:** Construct groove according to pavement marking material manufacturer's recommendations with the following minimums.
   a. **Paint:** Minimum groove depth of 60 mils.
   b. **Tape:** Minimum groove depth of 100 mils.

2. **Groove Width:** Marking width plus 1 inch with a tolerance of minus 0.0 inches and plus 0.2 inches.

3. **Groove Length:** Full length of tape plus 3 inches minimum grooving transition on either end. Do not use a continuous groove for dash markings. When replacing existing dash markings, start cycle so most of the existing marking is removed with the groove. No additional removal of existing markings is required.

4. **Groove Position:** Locate grooves a minimum of 2 inches from edge of longitudinal joints.

5. **Finished Surface:** Ensure the bottom of the groove has a fine corduroy-like texture. The maximum allowable rise between the high and low points across the width of the groove is 10 mils.

6. **Groove Cleaning:** Ensure the surface to receive the marking is free from dust, dirt, or other contaminates that may interfere with the marking properly bonding.
   a. **Dry Cutting:** Vacuum and broom grooves using a high pressure air blast for the final cleaning.
   b. **Wet Cutting:**
      1) Immediately flush the groove with high pressure water and recover the removed material.
      2) Allow the surface to dry a minimum of 24 hours to a visibly dry condition.

K. Limitations:

1. **General:**
   a. Coordinate pavement marking application with other construction work and associated traffic control changes.
   b. Complete the placement of pavement markings before the lane, road, on-site detour, or diversion is open to traffic.
   c. If unavoidable circumstances result in not being able to complete the pavement marking placement or removal specified for that day, provide traffic control until the pavement marking placement or removal work is completed.

d. Follow the manufacturer's written recommendations for all details of application.

2. **Temperature Restrictions:**
   a. **Waterborne and Solvent Based Paint Pavement Markings:** Comply with Table 8020.05.

Table 8020.05: Pavement Marking Temperature Restrictions

Type of Marking	Oct. 23 to April 7	April 8 to April 22	April 23 to Oct. 7	Oct. 8 to Oct. 22
Waterborne Paint	not allowed	45° F	45° F	45° F
Low Temperature Waterborne Paint per Iowa DOT Materials I.M. 483.03	35° F	35° F	35° F	35° F
Solvent Based Paint	No restrictions	No restrictions	(a)	No restrictions

(a) Only use solvent-based paint if temperature requirements for waterborne paint cannot be met.

   b. **Durable Paint Pavement Markings:**
      1) Air and pavement surface temperature are 40°F and rising.
      2) The Engineer may allow placement of durable paint at temperatures below these values based on the durable paint manufacturer's written recommendations.
   c. **High-Build Waterborne Paint Pavement Markings:**
      1) Air and pavement surface temperature are 50°F and rising.
      2) When temperatures are below 50°F, the Engineer may approve the use of marking products denoted by the manufacturer as "low-temperature." When approved, low-temperature paints may be applied when temperatures are between 32°F and 50°F.
   d. **Marking Tape Pavement Markings:**
      1) Air and pavement surface temperature are 50°F and rising.
      2) Minimum overnight temperature of 40°F the night before application
      3) The Engineer may allow placement of marking tape at temperatures below these values based on the marking manufacturer's written recommendations.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Certification of Products

B. Acceptance and Warranty

C. Seed Types and Mixes

D. Equipment

E. Application of Seed

1.02 DESCRIPTION OF WORK

Includes the requirements for seedbed preparation; furnishing, applying, and covering the seed; and compaction of the seedbed.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following:

A. Submit certification of products to the Engineer prior to seed placement:

1. Seed: Submit a laboratory analysis for all seeds, specifying the purity and germination. Provide a lot number on all submittals and labeling. Ensure lot number is the same on all records pertaining to a particular seed. Provide 48 hours notice prior to mixing the seed and give the Engineer an opportunity to witness the seed mixing. Submit a mechanically printed seed tag from an Iowa Crop Improvement Association-approved seed conditioner or grower.

2. Fertilizer: Submit certification of the fertilizer analysis with scale weight and statement of guaranteed analysis. Submit from a certified fertilizer dealer, a mechanically printed commercial fertilizer label, or bill of lading. Comply with the inspection and acceptance requirements of Iowa DOT Materials I.M. 469.03.

3. Wood Cellulose Fiber Mulch: Submit certification of the degradable wood cellulose fiber mulch ingredients with applicable use and rate, and the water retention capacity by manufacturer or supplier.

4. Wood Excelsior Mulch: Bale wood excelsior and determine the mass (weight). Use the mass of the material, furnished by the manufacturer, to determine the rate of application.

5. Straw Mulch: Certify weight. Furnish a list of the number of bales and a corresponding ticket from an approved scale for the mulch material to be used on the project.

6. Compost: Submit certification of composted organics analysis with U.S. Compost Council's Seal of Testing Assurance (STA), recommended rates of application, and manufacturer's estimated cubic yards per ton.

7. Inoculant: Furnish information from inoculant packaging.

8. Tackifier: Submit certification of the tackifier ingredients, recommended rates of application, and expiration date.

B. Submit written instructions recommending procedures for maintenance of seeded areas.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions, as well as the following:

A. Deliver packaged materials in original, unopened, and undamaged containers. Do not mix or blend materials except in the presence of the Engineer.

B. Deliver, handle, and store all materials according to product recommendations, and protect from loss, damage, and deterioration.

C. Materials not meeting these requirements will be rejected.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions, as well as the following:

A. Coordinate the seeding schedule with all other work on the project. Notify the Engineer at least three calendar days prior to the start of seeding operations.

B. After all land-disturbing activities are complete and the seedbed has been approved by the Engineer, perform seeding operations.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 SEED

A. General:

1. Provide fresh, clean, new crop, certified seed complying with tolerance for germination and purity and free of poa annua, bent grass, and noxious weed seed. Furnish all seeds, including grass, legume, forbs, and cereal crop seeds, from an established seed dealer or certified seed grower. All materials and suppliers are to follow Iowa Seed Law and Iowa Department of Agriculture and Land Stewardship regulations, and be labeled accordingly.
   a. Provide turfgrass with a certified “blue tag” or "gold tag."
   b. Provide native grass and forbs that are source-identified as G0-Iowa certified "yellow tag," when available. If G0-Iowa certified "yellow tag" sourced seed is unavailable, or is only available from a single source, a substitution may be approved by the Engineer.

2. Mix seed to the specified proportions by weight. Use methods approved by the Engineer.

B. Seed Quality: Ensure the seed provided meets or exceeds the minimum

requirements of purity and germination stated on an independent certificate of seed analysis document according to the Association of Official Seed Analysis (AOSA) rules. The seed certification tag and seed analysis document provided must be from the same lot number as shown on the seed tag. Ensure the date of test results is no greater than 9 months from the seed application date. Approval of all seed for use will be based on the accumulated total of Pure Live Seed (PLS) for each phase of work. PLS is obtained by multiplying purity times germination. PLS shall not be less than the accumulated total of the PLS specified.

If the seed does not comply with minimum requirements for purity and germination and such seed cannot be obtained, the Engineer may approve use of the seed on a basis of PLS or may authorize a suitable substitution for the seed specified.

C. Requirements on Containers:

1. **Seed:** Provide seed with a tag on each container. Ensure the seed analysis on the label is mechanically printed.

2. **Mulch:** When packaged, provide mulch in new labeled containers.

3. **Tackifier:** Provide tackifier packaged in new labeled containers.

4. **Inoculant:** Use inoculant that has a manufacturer's container, indicating the specific legume seed to be inoculated and the expiration date. All inoculant must meet requirements of the Iowa Seed Law. Follow precautions specified on the product label.

5. **Sticking Agent:** Use a commercial sticking agent recommended by the manufacturer of the inoculant. For quantities less than 50 pounds, the sticking agent need not be a commercial agent, but requires approval by the Engineer. Apply sticking agent separately prior to application of inoculant. Follow safety precautions specified on the product label.

Table 9010.01: Domestic Grasses

Common Name	Scientific Name	Purity (%)	Germination (%)
Bluegrass, Kentucky	Poa pratensis	85	80
Brome, smooth-LINCOLN	Bromus inermis	90	85
Fescue, creeping, red	Festuca rubra	98	85
Fescue, tall, FAWN	Festuca arundinacea-FAWN	98	85
Orchardgrass	Dactylis glomerata	90	90
Red top	Agrostis alba	92	85
Ryegrass, perennial	Lolium perenne	95	90
Wildrye, Canada	Elymus Canadensis	95	85
Wildrye, Russian	Psathyrostachys junceus	95	85

Table 9010.02: Legumes

Common Name	Scientific Name	Purity (%)	Germination (%)
Alfalfa, RANGER/VERNAL	Medicago sativa	99	90*
Alfalfa, travois	Medicoa spp.	99	90*
Clover, Alsike	Trifolium hybridum	99	90*
Clover, red, medium	Trifolium pratense	99	90*
Clover, white	Trifolium repens	98	90*

Hairy vetch	Vicia villosa	96	85*
Lespedeza, Korean	Lespedeza stipulacea	98	80*

* Includes hard seed.

Table 9010.03: Stabilizing Crop

Common Name	Scientific Name	Purity (%)	Germination (%)
Oats	Avena sativa	97	90
Rye	Secale cereale	97	90
Sudangrass, PIPER	Sorghum vulgare var. sudanese	98	85

Table 9010.04: Native Grasses

Common Name	Scientific Name
Big bluestem*	Andropogon gerardii
Blue grama	Bouteloua gracilis
Blue-joint grass	Calamagrostis Canadensis
Bottlebrush sedge	Carex hystericina
Buffalograss*	Buchloe dactyloides
Common rush	Juncus effusus
Fowl bluegrass	Poa palustris
Fowl manna grass	Glyceria striata
Fox sedge	Carex vulpinoidea
Green bulrush	Scirpus atrovirens
Hairy wood chess	Bromus purgans
Indiangrass*	Sorghastrum nutans
Intermediate wheatgrass	Agropyron intermedium
Little bluestem*	Andropogon scoparius
Prairie dropseed	Sporobolus heterolepis
Reed manna grass	Glyceria grandis
Rice cutgrass	Leersia oryzoides
Rye grass, annual	Lolium italicum
Sand bluestem*	Andropogon gerardii, var. paucipilus
Sand dropseed	Sporobolus cryptandrus
Sand lovegrass	Eragrostis trichodes
Sideoats grama*	Bouteloua curtipendula
Slender wheatgrass	Agropyron trachycaulum, var. unilaterale
Spike rush	Eleocharis palustris
Softstem bulrush	Schoenoplectus tabernaemontani
Switchgrass*	Panicum virgatum
Tussock sedge	Carex stricta
Virginia wild-rye	Elymus virginicus
Weeping lovegrass	Eragrostis curvula
Western wheatgrass*	Agropyron smithii
Wool grass	Scirpus cyperinus

Table 9010.05: Forbs

Common Name	Scientific Name
Black-eyed Susan	Rudbeckia hirta
Blue-flag iris	Iris virginica-shrevii
Boneset	Eupatorium perfoliatum
Canadian anemone	Anemone canadensis
Common mountainmint	Pycnanthemum virginianum
Common rush	Juncus effusus
Fowl manna grass	Glyceria striata
Golden Alexanders	Zizia aurea
Great blue lobelia	Lobelia siphilitica
Grey-headed coneflower	Ratibida pinnata
Heath aster	Symphyotrichum ericoides
Ironweed	Veronia faxciculate
Joe-pye weed	Eupatorium maculatum
Meadow blazingstar	Liatris ligulistylis
Milkweed, butterfly	Asclepias tuberosa
Milkweed, swamp	Asclepias incarnata
New England aster	Symphyotrichum novae-angliae
Ohio spiderwort	Tradescantia ohiensis
Oxeye sunflower	Heliopsis helianthoides
Pale purple coneflower	Echinacea pallida
Partridge pea	Chamaecrista fasciculate
Prairie blazing star	Liatris pycnostachya
Purple prairie clover	Dalea purpurea
Rattlesnake master	Eryngium yuccifolium
Reed manna grass	Glyceria grandis
Rice cutgrass	Leersia oryzoides
Showy goldenrod	Solidago speciosa
Showy tic-trefoil	Desmodium canadense
Stiff goldenrod	Solidago rigida
Swamp aster	Aster puniceus
White wild indigo	Baptisia alba
Wild bergamot	Monarda fistulosa

2.02 SEED MIXTURES AND SEEDING DATES

See the contract documents for the specified seed mixture. If a mixture is not specified, use the following. The Contractor may submit a modification of the mixture for the Engineer's consideration.

A. Type 1 (Permanent Lawn Mixture): Used for residential and commercial turf site, fertilized, and typically mowed. Use between March 1 and May 31 and between August 10 and September 30.

Table 9010.06: Type 1 Seed Mixture[1]

Common Name	Application Rate lb/acre
Creeping red fescue	25
Turf-type perennial ryegrass[2]	20
Turf-type perennial ryegrass[2]	20
Kentucky bluegrass cultivar[3]	65

Kentucky bluegrass cultivar[3]	65
Kentucky bluegrass cultivar[3]	65

[1] A commercial mixture may be used if it contains a high percentage of similar bluegrasses; it may or may not contain creeping red fescue.
[2] Choose two different cultivars of turf-type perennial ryegrass, at 20 lbs/acre each.
[3] Choose three different cultivars of Kentucky bluegrass, at 65 lbs/acre each.

B. **Type 2 (Permanent Cool Season Mixture for Slopes and Ditches):** Not typically mowed. Reaches a maximum height of 2 to 3 feet, low fertility requirements, grows in the spring and fall, and can go dormant in the summer. Use between March 1 and May 31 and between August 10 and September 30.

Table 9010.07: Type 2 Seed Mixture

Common Name	Application Rate lb/acre
Tall fescue[1]	100
Kentucky bluegrass	20
Ryegrass, perennial[2]	75

[1] Use endophyte free cultivars including Fawn, K-31, or a combination.
[2] Use cultivars including Linn, Amazon, Noriea, or Nui, or a combination.

C. **Type 3 (Permanent Warm-Season Slope and Ditch Mixture):** Not typically mowed. Reaches a height of 5 to 6 feet, stays green throughout summer, and responds well to being burned in spring; no fertilizer. Use between March 1 and June 30.

Table 9010.08: Type 3 Seed Mixture

Common Name	Application Rate lb/acre
Big bluestem*	3 PLS
Grain rye	40
Indiangrass*	4 PLS
Little bluestem*	3 PLS
Oats	16
Sideoats grama*	5 PLS
Switchgrass*	1 PLS

* Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa.

D. **Type 4 (Urban Temporary Erosion Control Mixture):** Short lived (6 to 8 months) mix for erosion control.

Table 9010.09: Type 4 Seed Mixture

Common Name	Application Rate lb/acre
SPRING - March 1 - May 20	
Annual ryegrass	40
Oats*	65
SUMMER - May 21 - August 14	
Annual ryegrass	50
Oats*	95
FALL - August 15 - September 30	
Annual Ryegrass	40
Grain rye	65

* Engineer may delete for previously established urban areas.

E. **Type 5 (Rural Temporary Erosion Control Mixture):** Short lived mix for erosion control.

Table 9010.10: Type 5 Seed Mixture

Common Name	Application lb/acre
March 1 - October 31	
Canada wildrye	5 PLS/acre
Grain rye	50
Oats	50
November 1 - February 28 (or 29)	
Canada wildrye	7 PLS/acre
Grain rye	62
Oats	62

Seed does not need to be certified Source Identified Class (Yellow Tag).

F. **Type 6 (Salt-resistant Mixture):** Use for grass medians and areas immediately back of curb on streets subject to regular salt applications for winter de-icing. Apply between March 1 and May 31 and between August 10 and September 30.

Table 9010.11: Type 6 Seed Mixture

Common Name	Application Rate lb/acre	Purity (%)	Germination (%)
Blue chip Kentucky bluegrass	37.5	90	85
Fults alkali grass	75	98	85
Hard fescue	50	95	85
Nublue Kentucky bluegrass	37.5	90	85
Sheeps fescue	50	90	85

G. **Wetland Seeding:** Between April 1 and June 30, use the following seed mixture for wetland grass seeding areas.

Table 9010.12: Wetland Grass Seed Mixture

Common Name	Scientific Name	PLS** (per ac)
Arrowhead	Sagittaria latifolia	4 oz
Big bluestem*	Andropogon gerardii	1 lb
Bluejoint grass	Calamagrostis	1 oz
Blue vervain	Verbena Hastata	1 oz
Boneset	Eupatorium perfoliatum	1 oz
Broom sedge	Carex scoparia	2 oz
Dark green bulrush*	Scirpus atrovirens	1 oz
Fox sedge*	Carex vulpinoidea	4 oz
New England aster*	Symphyotrichum novae-angliae	2 oz
Nodding bur marigold	Bidens cernua	8 oz
Porcupine sedge	Carex hystericina	8 oz
Prairie cordgrass	Spartina pectinata	1 lb
Rice cutgrass	Leersia oryzoides	4 oz
Sneezeweed	Helenium autumnale	2 oz
Softstem bulrush	Schoenoplectus tabernaemontani	8 oz
Spike rush	Eleocharis palustris	4 oz
Swamp milkweed*	Asclepias incarnata	1 lb

Switchgrass*	Panicum virgatum	8 oz
Tussock sedge	Carex stricta	2 oz
Virginia wild-rye*	Elymus virginicus	5 lbs
Water plantain	Alisma plantago-aquatica	4 oz

* Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa.
** Seeding rates for wetland grasses are given as PLS. Either the germination test or Tetrazolium (TZ) test is acceptable to determine PLS for native species.

H. Native Grass and Forbs (Wildflower) Seeding: Between April 1 and June 30, use the following seed mixture for areas designated for native grass and wildflower seeding.

Table 9010.13: Native Grass and Forbs (Wildflower) Seeding Mixture

Common Name	Scientific Name	Application Rate**
GRASSES		**lb/acre**
Big bluestem*	Andropogon gerardii	1.0
Canada wild rye	Elymus Canadensis	1.5
Indiangrass*	Sorghastrum nutans	1.0
Little bluestem*	Schizachyrium scorparium	2.0
Sideoats grama*	Bouteloua curtipendula	2.5
Switchgrass*	Panicum virgatum	0.5
FORBS (WILDFLOWERS)		**oz/acre**
Black-eyed Susan	Rudbeckia hirta	3.0
Butterfly milkweed	Asclepias tuberosa	4.0
Canadian anemone	Anemone canadensis	0.5
Common mountainmint	Pycnanthemum virginianum	0.25
Golden Alexanders	Zizia aurea	8.0
Grey-headed coneflower	Ratibida pinnata	2.75
Heath aster	Symphyotrichum ericoides	0.25
Ironweed	Veronia faxciculate	3.0
New England aster	Symphyotrichum novae-angliae	1.25
Ohio spiderwort	Tradescantia ohiensis	7.0
Oxeye sunflower	Heliopsis helianthoides	12.0
Pale purple coneflower	Echinacea pallida	15.0
Partridge pea	Chamaecrista fasciculate	32.0
Prairie blazing star	Liatris pycnostachya	4.5
Purple prairie clover	Dalea purpurea	2.5
Rattlesnake master	Eryngium yuccifolium	1.75
Showy goldenrod	Solidago speciosa	0.50
Stiff goldenrod	Solidago rigida	1.0
Swamp milkweed	Asclepias incarnata	4.0
White wild indigo	Baptisia alba	2.0
Wild bergamot	Monarda fistulosa	1.25
NURSE CROP		**lb/acre**
Oats (spring seeding - April 1 to June 30)		32
Winter wheat (dormant/frost seeding - November 1 to March 31)		25

* Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa.
** Seeding rates for native grass and forb species are given as PLS. Either the germination test or Tetrazolium (TZ) test is acceptable to determine PLS for native species.

2.03 FERTILIZER

Use fertilizer of the grade, type, and form specified that complies with rules of the Iowa Department of Agriculture and Land Stewardship and the following requirements:

A. Grade: Identify the grade of fertilizer according to the percent nitrogen (N), percent of available phosphoric acid (P_2O_5), and percent water soluble potassium (K_2O), in that order, and base approval on that identification.

The Contractor may substitute other fertilizer containing analysis percentages different from those specified, provided that the minimum amounts of actual nitrogen, phosphate, and potash per acre are supplied, and that in no case does the total amount per acre of the three fertilizer elements be exceeded by 30% of the following minimum amounts.

1. **For Conventional Seeding, Permanent:** Apply a 6-24-24 commercial fertilizer or the equivalent units of nitrogen, phosphate, and potash at the rate of 300 pounds per acre.

2. **For Conventional Seeding, Temporary:** Apply commercial fertilizer to all seeded areas at the rate of 250 pounds per acre of 13-13-13 (or equivalent) for rural mixes and 300 pounds per acre of 6-24-24 (or equivalent) for urban mixes, unless otherwise specified in the contract documents.

3. **For Hydraulic Seeding:** Apply fertilizer in combination with seeding by a hydraulic seeder and as specified in Iowa DOT Article 2601.03, B. Apply a commercial fertilizer or the equivalent units of nitrogen, phosphate, and potash at the rate specified for the type of seeding being applied.

4. **For Pneumatic Seeding:** Based on the compost nutrient analysis, supply any additional commercial fertilizer necessary to meet the 13-13-13 units of nitrogen, phosphate, and potash at the rate of 450 pounds per acre as the compost is applied.

B. Type: Use fertilizer that can be uniformly distributed by the application equipment. Furnish fertilizer either as separate ingredients or in chemically-combined form.

2.04 STICKING AGENT

A. Use a sticking agent that is a commercial material recommended by the manufacturer to improve adhesion of inoculant to the seed. For small quantities less than 50 pounds, the sticking agent need not be a commercial agent, but it must be approved by the Engineer and must be applied separately, prior to application of inoculant.

B. Follow safety precautions specified on the product label. A sticking agent is not required if a liquid formulation of inoculant is used.

2.05 INOCULANT FOR LEGUMES

An inoculant is a culture of bacteria specifically formulated for each legume seed (alfalfa, clovers, lespedesa, and hairy vetch). Ensure the manufacturer's container indicates the specific legume seed to be inoculated and the expiration date. Use inoculant that meets the requirements of the Iowa Seed Law. Follow the safety precautions specified on the product label.

2.06 WATER

Use water that is free of any substance harmful to seed germination or plant growth.

2.07 MULCH

A. For Conventional Seeding:

1. Material used as mulch may consist of the following:
   a. Dry cereal straw (oats, wheat, barley, or rye)
   b. Prairie hay
   c. Wood excelsior composed of wood fibers, at least 8 inches long, based on an average of 100 fibers, and approximately 0.024 inch thick and 0.031 inch wide. The fibers must be cut from green wood and be reasonably free of seeds or other viable plant material.

2. Do not use other hay (bromegrass, timothy, orchard grass, alfalfa, or clover).

3. All material used as mulch must be free from all noxious weed, seed-bearing stalks, or roots and will be inspected and approved by the Engineer prior to its use.

4. The Contractor may use other materials, subject to the approval of the Engineer.

B. For Hydraulic Seeding:

1. Wood Cellulose:
   a. Use material that is a natural or cooked cellulose fiber processed from whole wood chips, or a combination of up to 50% of cellulose fiber produced from whole wood chips, recycled fiber from sawdust, or recycled paper (by volume).
   b. Product contains a colloidal polysaccharide tackifier adhered to the fiber to prevent separation during shipment and avoid chemical co-agglomeration during mixing.
   c. Form a homogeneous slurry of material, tackifier, and water.
   d. Use a slurry that can be applied with standard hydraulic mulching equipment.
   e. Dye the slurry green to facilitate visual metering during application.
   f. Do not use materials that have growth or germination-inhibiting factors or any toxic effect on plant or animal life when combined with seed or fertilizer.

2. Bonded Fiber Matrix (BFM):
   a. Manufactured to be applied hydraulically.
   b. Dyed to facilitate visual metering.
   c. All components pre-packaged by manufacturer to ensure material performance and compliance. Field mixing of additives or any components will not be allowed.
   d. Meet the following requirements:
      1) Contain non-toxic tackifiers that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil according to ASTM D 7101 and EPA 2021.0-1.
      2) Contain no germination or growth inhibiting factors and do not form a water- resistant crust that can inhibit plant growth.
      3) Hydraulic mulch that is completely photo-degradable or biodegradable.
      4) Have a rainfall event (R-factor) of 140 < R according to ASTM D 6459.
      5) Have a cover factor of C ≤ 0.03 according to ASTM D 6459.
      6) Vegetation Establishment of 400% minimum according to ASTM D 7322.
      7) Water Holding Capacity 600% minimum according to ASTM D 7367.

3. Mechanically-Bonded Fiber Matrix (MBFM):
   a. Manufactured to be applied hydraulically.
   b. Dyed to facilitate visual metering.
   c. All components pre-packaged by manufacturer to ensure material performance and compliance. Field mixing of additives or any components will not be allowed.
   d. Meet the following requirements:
      1) Contain non-toxic tackifiers that upon drying become insoluble and non-dispersible to eliminate direct raindrop impact on soil according to ASTM D 7101 and EPA 2021.0-1.
      2) Contain no germination or growth inhibiting factors and do not form a water- resistant crust that can inhibit plant growth.
      3) Hydraulic mulch that is completely photo-degradable or biodegradable.
      4) Have a rainfall event (R-factor) of 162 < R according to ASTM D 6459.
      5) Have a cover factor of C ≤ 0.01 according to ASTM D 6459.
      6) Vegetation establishment of 500% minimum according to ASTM D 7322.
      7) Water holding capacity of 700% minimum according to ASTM D 7367.

C. For Pneumatic Seeding: Use compost meeting the following requirements.

1. Derived from a well-decomposed source of organic matter.

2. Produced using an aerobic composting process, meeting Code of Federal Regulations (CFR) 503 for time, temperature, and heavy metal concentrations.

3. No visible admixture of refuse or other physical contaminants, nor any material toxic to plant growth.

4. Certified by the U.S. Composting Council's Seal of Testing Assurance (STA) program.

5. Conforms to chemical, physical, and biological parameters of AASHTO R 52, with the following additional requirements:
   a. Follow U.S. Composting Council's TMECC guidelines for all testing.
   b. Organic Matter Content: 30% minimum.
   c. pH: between 6.0 and 8.0.
   d. Maturity (growth screening): Minimum 90% emergence for all compost to be vegetated.
   e. Particle Size:

Sieve Size	Percent Passing*
2"	100
1"	90-100
3/4"	65-100
3/8"	0-75

*6 inch maximum particle length.

PART 3 - EXECUTION

3.01 EQUIPMENT

A. Aerial Equipment: When aerial application of seed and fertilizer is specified, use aerial equipment capable of providing a uniform distribution of seed and fertilizer on the specified area.

B. Compost Blower: A compost blower is pneumatic equipment to blow compost over

the desired area. It may be equipped with a supplemental seed injection system. Use equipment with sufficient power to cover the required area without driving on the prepared seedbed.

C. **Cultipacker:** Use a pull-type cultipacker with individual rollers or wheels. Cultipackers with sprocket-type spacers between the wheels may be used. The cultipacker must produce a corrugated surface on the area being compacted. Operate the cultipacker separately from all other operations, and do not attach the cultipacker to the seeder or disk, unless combined cultipacker seeder is manufactured to operate as a unit. Make provisions for addition of weight.

D. **Disk:** When preparing a seedbed on ground having heavy vegetation, use a disk with cutaway blades. Make provisions for the addition of weight to obtain proper cutting depth.

E. **Drop Seeder:** Use one piece of equipment containing pulverizer rollers in front of the seed tubes, ground driven seed meters, maximum seed tube spacing of 3 inches delivering seed between the pulverizer rollers and packer wheels, and packer wheels that press and firmly pack seed into the soil.

F. **Endgate Cyclone Seeders:** Endgate cyclone seeders must be suitably mounted. Movement must be provided by mechanical means. The seed drops through an adjustable flow regulator onto a rotating, power driven, horizontal disk or fan.

G. **Expanded Mesh Roller:** Use equipment that is an open grid type or a cultipacker type, modified by covering with expanded metal mesh.

H. **Field Tiller:** Use equipment designed for the preparation of the seedbed to the degree specified.

I. **Gravity Seeders:** Gravity seeders must provide agitation of the seed, have an adjustable gate opening, and uniformly distribute seed on the prepared seedbed. Use a seed hopper equipped with baffle plates spaced no more than 2 feet apart. The baffle plates must extend from the agitator shaft to within approximately 2 inches of the top of the seed hopper. Wind guards are required to facilitate seeding when moderate wind conditions exist and when ordered by the Engineer. Place wind guards in front or in back (or both) of the seed outlet and extend them to near the ground line. This seeder may be used for application of fertilizer.

J. **Hand Cyclone Seeders:** Hand cyclone seeders are carried by the person dispensing seed. The seed drops through an adjustable flow regulator onto a rotating, hand driven, horizontal disk or fan.

K. **Hydraulic Seeder:** Use hydraulic seeding equipment with a pump rated at no less than 100 gallons per minute. Inoculant, seed, and fertilizer may be applied in a single operation. The equipment must have a suitable working pressure and a nozzle adapted to the type of work. Supply tanks must have a means of agitation. Calibrate tanks and provide them with a calibration stick or other approved device to indicate the volume used or remaining in the tank.

L. **Mowers:** Use mowers that are rotary, flail, disk, or sickle type. Do not use mowers that bunch or windrow the mowed material.

M. Mulch Anchoring Equipment: Use mulch anchoring equipment designed to anchor straw or hay mulch into soil by means of dull blades or disks. It should have flat blades or disks, may have cutaway edges and must be spaced at approximately 8 inch intervals. The mulch anchoring equipment must be pulled by mechanical means and weigh approximately 1,000 pounds. When directed by the Engineer, increase the weight by addition of ballast.

N. Native Grass Seed Drill: Use a native grass seed drill designed to provide uniform distribution of native grass and wildflower seeds. Provide separate seed boxes to apply both small seeds as well as fluffy bearded seeds. If a no-till attachment is specified, use an attachment of the same manufacturer as the drill.

O. Pneumatic Seeder: Use an air blown system with sufficient power and hose to reach 300 feet.

P. Pulverizer: Use equipment designed to break up compacted soil to prepare a seedbed.

Q. Rotary Tiller: Use equipment with rotary-type blades designed for the preparation of seedbed to the degree specified.

R. Slit Seeder: Use a gas, diesel or electric powered mechanical slit seeder that is capable of cutting vertical grooves a maximum of 1/4 inch deep into the soil with a maximum horizontal blade spacing of 3 inches, deposits metered seed directly after the formation of the vertical grooves, and contains packer wheels that press and firmly pack seed into the soil.

S. Slope Harrow: Use a slope harrow, consisting of a rolling weight attached by heavy chain to a tractor. The chain must be of suitable length, with picks attached, and a means of rotating the picks as the rolling weight is pulled in a direction parallel to the movement of the tractor.

T. Spike Tooth Harrow: Use equipment designed to provide adjustment of the spike teeth to level the ground, or to be used as specified by the Engineer.

U. Straw Mulching Machine: Use a machine to uniformly apply mulch material over the desired area without excessive pulverization. Excessive pulverization is the general absence of straw longer than 6 inches after distribution.

3.02 AREA OF SEEDING

Place seed only in the areas specified in the contract documents. Repair damaged areas that are disturbed outside the contract limits at the expense of the Contractor. Do not disturb areas having a satisfactory growth of desirable grasses or legumes.

3.03 FINISH GRADING AND TOPSOIL

See Section 31 20 00 for finish grading and topsoil placement.

3.04 CONVENTIONAL SEEDING

A. Order of Operations: 1) fertilizing, 2) seedbed preparation, 3) seed preparation/application, and 4) mulching.

B. Fertilizing:

1. Apply fertilizer immediately prior to seedbed preparation. Incorporate the fertilizer

into the top 2 to 3 inches of topsoil during the seedbed preparation. Equipment that results in ruts or excessive compaction will not be allowed.

2. Do not apply fertilizer with native grass, wildflower, or wetland seeding.

C. Seedbed Preparation, Permanent:

1. Limit preparation of seedbed to areas that will be seeded immediately upon completion.

2. Work areas accessible to field equipment to a depth of no less than 3 inches. Use mechanical rotary tillage equipment for the preparation of seedbed on earth shoulders, urban or raised medians, and rest areas. Prepare by hand areas inaccessible to field machinery, to a depth of no less than 2 inches. Use care that the entire width of the shoulder and areas around headwalls, wingwalls, flumes, and other structures are prepared in the manner specified. Where weed growth has developed extensively, they may be disked into the ground. If weed growth develops sufficiently to interfere with proper seedbed preparation, mow the weeds and remove them from the project at no additional cost to the Contracting Authority.

   Use crawler type or dual-wheeled tractors for seedbed preparation. Operate equipment in a manner to minimize displacement of soil and disturbance of the design cross-section. Harrow ridging in excess of 4 inches due to operation of tillage equipment prior to rolling with the cultipacker. Roll the area with no less than one pass of the cultipacker prior to permanent seeding.

3. Shape and fine grade to remove rills or gullies, water pockets, undesirable vegetation, and irregularities to provide a smooth, firm, and even surface true to grade and cross- section. For Type 1 (lawn seeding), prepare to a fine texture and without soil lumps. Coordinate preparation of all ditches designated for special ditch control with the seedbed preparation. Till parallel to the contours.

4. Smooth the seedbed with a cultivator-type tillage tool having a rake bar or a rock rake. Pick up and remove all debris, such as rocks, stones, concrete larger than 2 inches (1/2 inch maximum for lawn seeding), or roots and other objectionable material that will interfere with the seeding operation. A spring tooth cultivator may be used in lieu of a rock picker. Remove the rock by hand after each use of the cultivator; repeat the process until the soil is relatively free of rock as determined by the Engineer.

5. Choose equipment to minimize soil compaction. Operate equipment in a manner to minimize displacement of soil and disturbance of the design cross-section. Roll the area with at least one pass of the cultipacker. Remove ruts that develop during the sequence of operations before subsequent operations are performed. This must be completed just prior to seeding and the work approved by the Engineer before the seeding application.

D. Seedbed Preparation, Temporary: Till the soil to a minimum depth of 5 inches with a disk, harrow, or field cultivator.

E. Seeding:

1. Seed Preparation:

a. Thoroughly mix all seed specified for the contract prior to placing the seed in the seed hopper. Provide 48 hours notice prior to mixing the seed, and give the Engineer an opportunity to witness the seed mixing. The mixing of a

certified blue tag seed mix at an approved (by Iowa Crop Improvement Association) seed conditioner's facility need not be witnessed.

b. Treat all legume seed with a commercial sticking agent to be applied prior to application of inoculant, or as a mixture when the sticking agent is compatible with other materials. A sticking agent is not required if a liquid formulation of inoculant is used. Use mechanical mixing equipment to apply sticking agent and inoculant on seed quantities over 50 pounds.

c. Inoculate all legumes with a standard product humus culture before being mixed with other seeds for sowing.

d. Inoculate all legumes with a standard culture at the rate specified by the manufacturer of the inoculant according to Iowa DOT Article 4169.04. Do not expose inoculated seed to direct sunlight for more than 30 minutes. Re-inoculate seed that is not sown within 8 hours after inoculation prior to use. Pre-inoculated seed with
manufacturer's recommended protective coating may be used in lieu of seed with Contractor-applied inoculant.

e. When the gravity or cyclone seeder is used for application of seed, inoculate legume seed according to the manufacturer's recommended procedures, before mixing with other grass seeds for sowing. Furnish and apply inoculant.

2. Seed Application, Permanent:

a. Prior to seeding, the seedbed will be inspected and approved by the Engineer. Use methods and procedures consistent with equipment manufacturer's recommendations; however, do not operate ground-driven equipment at speeds greater than 10 mph.

b. On all areas accessible to machinery, sow seed with a gravity seeder, endgate cyclone seeder, or seed drill.

c. On areas inaccessible to field machinery, the use of hand-operated cyclone seeders will be allowed, but no other hand-seeding methods will be accepted.

d. The application of grass and legume seed with hand seeders on early spring work must be performed as separate operations. No mixing of the two types of seed will be allowed.

e. All seeded areas will have one pass with a roller or cultipacker to firm the soil.

3. Seed Application, Temporary:

a. On areas accessible to field machinery, sow seed with an endgate cyclone seeder.

b. On areas inaccessible to field machinery, the use of hand-operated cyclone seeders will be allowed, but no other hand-operated seeding methods will be accepted.

c. Cover the seed and fertilizer by lightly tilling the seeded area with a disk, rigid harrow, spring tooth harrow, or field cultivator.

4. Seeding Outside of the Specified Seeding Dates: With the agreement of the Engineer and at the full responsibility of the Contractor, seeding operations for all seed types may be conducted outside the specified seeding dates. Should the seeded areas require reseeding, it must be done as specified and at no additional cost to the Contracting Authority.

a. Dormant Seeding: When winter dormant seeding is allowed or specified by the Jurisdiction, complete it when air temperatures are consistently below 40°F and prior to December 25 of a given year. Dormant seeding is not allowed on snow.

1) Prepare the seedbed before the ground freezes.
2) To ensure protection of the seed, apply on a frosty morning or before a predicted snow.
3) Seeding may be done by hand or with seeding equipment.
4) For hydraulic seeding, apply the fertilizer at no more than 0.5 pounds

nitrogen per 1000 square feet, followed by the seed.

b. **Frost Seeding (Overseeding):**
   1) Complete frost seeding, also referred to as overseeding, in the spring when the ground is friable from frost action (February 1 to April 1).
   2) Frost seeding is not allowed on more than 1 inch of snow.
   3) Seeding can be done with a hand-operated cyclone seeder or other equipment.
   4) Seedbed preparation will not be required provided the ground is friable from frost action.

F. Mulching:

1. Mulch all conventionally seeded areas the same day the seed is sown. Uniformly distribute the mulch over the required areas at a rate of 1.5 tons/acre for dry cereal straw, or native grass straw. Prairie hay is not suitable for Type 1 (lawn seeding).

2. Work the mulch into the soil with mulch anchoring equipment designed to anchor the mulch into the soil by means of dull blades or disks with a minimum of two passes. Operate equipment in a manner to minimize displacement of the soil and disturbance of the design cross-section.

3. Do not operate mulch-blowing equipment on slopes steeper than 2.5 to 1 or on slopes that may rut. Use attachments to apply mulch without traversing slopes.

4. Do not mulch when wind velocities exceed 15 mph.

3.05 HYDRAULIC SEEDING

A. Order of Operations:

1. Seedbed preparation

2. Seed application, fertilizing, and mulching

B. Seedbed Preparation: Follow seedbed preparation for conventional seeding in Section 32 92 19, 3.04.

C. Seed Preparation: Inoculant, in the quantities specified above, may be applied directly into the supply tank with seed, water, and other material.

D. Seed Application, Fertilizing, and Mulching:

1. Application Process:
   a. Combination: Place all material, seed, fertilizer, mulch, and tackifier (if applicable) in hydraulic mulching equipment specifically manufactured for hydraulic seeding.
   b. Separate: At the Contractor's option and at no additional cost to the Contracting Authority, the hydraulic seeding, fertilizing, and mulching may be undertaken separately. If hydraulic seeding is done separately, add 50 pounds of wood cellulose fiber complying with Section 9010, 2.07, B as a tracer for each 500 gallons of water in the hydraulic seeder tank. If operations are undertaken separately, complete fertilizing and mulching application within 24 hours of completing seeding work. Do not separate the applications if inclement weather is forecasted within 24 hours of the scheduled application period.

2. Ensure the hydraulic equipment, pump, and application process do not damage or crack seeds.

3. Mix materials with fresh potable water using a combination of both recirculation through the equipment's pump, and mechanical agitation to form a homogeneous slurry.

4. Apply mixture within 1 hour after seed and fertilizer are placed in the hydraulic seeder.

5. If necessary, dampen dry, dusty soil, to prevent balling of the material during application.

6. Apply the slurry evenly over all specified areas at component material rates specified.
   a. Wood Cellulose Mulch:
      1) Mulch: Minimum 3,000 lb/acre dry weight.
      2) Tackifier: Minimum 50 lb/acre.
   b. Bonded Fiber Matrix: Minimum 3,000 lb/acre dry weight.
   c. Mechanically-bonded Fiber Matrix: Minimum 3,000 lb/acre dry weight.

7. Retain and count empty bags of mulch to ensure final application rate.

8. Hydromulching may be done over conventional seeding and/or fertilizing, if approved by the Engineer.

E. Native Grass, Wildflower, and Wetland Grass Seeding: Hydraulic seeding of native grasses, wildflowers, and wetland grasses is allowed only if approved by the Engineer. If allowed, increase specific seed rates by 25%. Do not apply fertilizer.

3.06 PNEUMATIC SEEDING

A. Order of Operations: 1) seedbed preparation, 2) seed preparation, and 3) seed application.

B. Seedbed Preparation: Follow seedbed preparation for conventional seeding in Section 32 92 19, 3.04.

C. Seed Preparation: Follow seed preparation for conventional seeding in Section 32 92 19, 3.04. Pre-inoculate seed in the quantities specified above prior to placing in the seed equipment.

D. Seed Application:

1. Place all material, seed, fertilizer, and compost in equipment with a calibrated seeder attachment specifically designed for pneumatic seeding. Do not apply fertilizer with native grass, wildflower, or wetland seeding.

2. Apply compost to a 1 inch minimum depth on all designated disturbed areas. Apply the compost with a pneumatic (air blower) system with sufficient power and hose to reach 300 feet. Driving on the soil to apply compost will not be allowed.

3. Inject seed and fertilizer into the top 1/4 inch to 1/2 inch of compost during application with a calibrated seed injector at the specified rate. Do not inject native grasses and forbs more than 1/4 inch.

3.07 WATERING

A. Provide water, equipment, transportation, water tanker, hoses, and sprinklers.

B. Use enough water to keep the soil and mulch moist to a depth of 1 inch and ensure growth of the seed. For turfgrass seeding areas, sufficiently water to keep the soil moist for a minimum of 21 days. If natural rainfall is adequate to keep the soil and mulch moist, artificial watering may not be needed.

3.08 RE-SEEDING

A. When all work related to seeding, fertilizing, and/or mulching has been completed on an area, and is washed out or damaged, re-seed, fertilize, and/or mulch the area at the contract unit price(s) when so ordered by the Engineer.

B. When work related to seeding, fertilizing, and/or mulching has not been completed in an area and is washed out or damaged, re-seed, fertilize, and/or mulch the area as necessary at no additional cost to the Contracting Authority.

3.09 CLEAN UP

All work related to clean up throughout the project and upon completion is the responsibility of the Contractor, at no additional cost to the Contracting Authority.

A. Remove all excess materials, debris, and equipment upon completion of work.

B. Clean all paved surfaces open for public use at the end of each day and prior to forecasted precipitation.

C. Repair any damage resulting from seeding operations.

D. Remove hydraulic slurry and other excess debris related to seeding operations from buildings, landscaping, mulch, pavement, signs, sign posts, and any other areas not specified for application, at the end of each day.

3.10 ACCEPTANCE AND WARRANTY

A. Acceptance:

1. Guarantee in writing that all work has been completed as specified and provide the date that all activities were completed. When a warranty is a separately-bid item, this also establishes the beginning of the warranty period.

2. Acceptance will occur, provided seeded areas are in a live, healthy, growing, and well- established condition without eroded areas, bare spots, weeds, undesirable grasses, disease, or insects.
   a. Projects without a separately-bid warranty will be accepted no sooner than 60 days from the date that all activities were completed.
   b. When a warranty is established as a bid item and the warranty period exceeds 60 days, projects may be accepted after all specified work, excluding the warranty, is satisfactorily completed, and a supplemental contract for the warranty is executed according to the Code of Iowa Section 573.27.

B. Warranty:

1. Required only when established as a bid item by the Engineer.

2. The warranty is to guarantee completed seeding areas for a maximum period of twelve months.

3. During the warranty period, correct and reseed any defects in the seeded areas and grass stand, such as weedy areas, eroded areas, and bare spots, until all affected areas are accepted by the Engineer.

4. Replace or repair to original condition, all damages to property resulting from the

seeding operation or from the remedying of defects, at the Contractor's expense.

5. Replacement costs are the Contractor's responsibility, except for those resulting from loss or damage due to occupancy of the project in any part, vandalism, civil disobedience, acts of neglect on the part of others, physical damage by animals, vehicles, fire, or losses due to curtailment of water by local authority, or by "Acts of God."

END OF SECTION

SECTION 32 93 00
PLANT MATERIAL AND PLANTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Plant Material and Planting

B. Tree Drainage Wells

C. Warranty for Plant Material

1.02 DESCRIPTION OF WORK

A. Furnishing, preparing, and installing plant material.

B. Constructing tree drainage wells.

C. Maintaining and replacing plants for completed planting work.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following:

A. Submit copy of current certification that the Supplier is an Iowa Department of Agriculture and Land Stewardship Certified Nursery Dealer or Grower prior to starting work.

B. Prior to final acceptance, submit written maintenance instructions recommending procedures for maintenance of all plant material types, including watering, insect and disease control, fertilizing, pruning, tree protection, and staking.

C. When requested, provide certification stating container-grown material has been grown in the container for no less than 1 year.

D. Provide a sample of the proposed mulch for approval by the Engineer.

E. When requested, submit a schedule of unit prices for each size and variety of tree, shrub, and ground cover plant specified in the contract documents.

1.04 SUBSTITUTIONS

Comply with General Provisions, as well as the following:

Where evidence is submitted that a specified plant cannot be obtained, substitution may be made upon approval of the Engineer.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions, as well as the following:

A. Protect plant root systems during transportation and storage, as necessary, with wet straw, moss, or other suitable material that will ensure root systems are maintained in a moist, healthy condition.

B. Protect all plants with a tarpaulin when being transported in an open vehicle.

C. When approved by the Engineer, temporary storage of plants on the project site may be allowed. When temporary on-site storage is not approved, provide such facilities and location at no additional cost to the Contracting Authority.

D. During temporary storage, heel-in plants and maintain them by providing moist straw, moss, or other suitable material to protect root systems; watering; and protecting from excessive sun, wind, and inclement weather conditions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions, as well as the following:

Comply with the optimum planting dates specified in Section 32 93 00, 3.01.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 PLANT MATERIALS

A. General:

1. Ensure plant material meets the minimum requirements of size and grade as stated in the latest edition of American Standard for Nursery Stock, ANSI Z60.1.

2. Provide all plants true to name and tagged legibly as to name according to nursery standards of practice as recommended by the American Nursery and Landscape Association. Plant names indicated comply with the latest edition of "Standardized Plant Names" as adopted by the American Joint Committee of Horticultural Nomenclature.

3. Plants larger than those specified in the plant list with corresponding root system may be used upon approval of the Engineer.

4. Match plants planted in rows in form and size, unless otherwise specified in the contract documents.

B. Plant Material Quality:

1. Provide nursery plants suitable to and grown in the same USDA Plant Hardiness Zone as the project location.

2. One-sided branching plants from tightly planted nursery rows will be rejected.

3. Provide healthy specimens without objectionable deformities, voids, and open spaces, with well-developed branch and root systems. Ensure specimens are true to height, shape, and character of growth of the species or varieties. Provide plants showing appearance of good health and vigor.

4. Provide plants free of the following:
   a. Harmful insects, insect eggs, borers, and all forms of infestation

b. Plant diseases and moldy or dried roots
c. Damage to trunk, bark, branches, leaders, root systems, or cut-leaders
d. Defects, disfiguring knots, sunscald injuries, and frost cracks
e. Rodent damage to bark and buds

5. Plants with broken or cut back terminal leaders or with circling roots may be rejected.

C. Balled and Burlapped Plants:

1. Provide firm, moist, unbroken root balls of the specified size.

2. Broken or loose root balls will be rejected.

3. No manufactured or artificially produced or mudded-in root balls will be accepted.

4. A container grown plant, in lieu of a balled and burlapped root ball, will be accepted provided it meets the specified size, species, complies with American Standard for Nursery Stock, ANSI Z60.1, and meets criteria for container grown plants.

D. Container Grown Plants:

1. Grow plants in sufficiently sized container for a minimum of 1 year, with a root system developed to hold its soil together, firm, whole, and moist when taken from the container.

2. No loose root systems in the container, root-bound, or circling of the root system will be accepted (ANSI Z60.1).

3. Containers with holes, shaping, or made of fabric as a means of preventing root growth from reaching the sides of the container, or pruning, or training roots to grow laterally rather than encircling the container are acceptable (ANSI Z60.1).

E. Bare Root Plants:

1. Only use where specified in the contract documents or as approved by Engineer.

2. Ensure plants have substantially all of the root system intact, with clean cuts on roots. Root system is to be packed in moisture-retaining material and bagged to protect the root system from drying out.

3. Prior to planting, properly prune and sweat according to the nursery source instructions.

4. Ensure plants are dormant or breaking bud if sweated at the time of planting.

5. Do not plant later than May 15.

2.02 MULCH

Provide hardwood or softwood mulch complying with the following:

A. Shredded bark and shredded wood mixture containing no more than 50% wood chips.

B. Produced by a mechanical debarker and chipping machine.

C. Reasonably free from leaves, twigs, dust, toxic substances, and any other foreign material.

D. Not in an excessively wet or decomposed condition.

2.03 BACKFILL MATERIAL

A. Retain backfill material for plantings from soil excavated from the planting pit.

B. Ensure backfill material is loose, friable, and free of clods, sod, vegetation, and rocks 2 inches in diameter or larger. Do not use frozen or muddy soil as backfill material.

2.04 STAKING MATERIAL

A. Stakes: Comply with Iowa DOT Article 4154.09. Minimum length of 6 feet.

B. Trunk Support Strapping:

1. Breathable, flexible strap material or arbor tie or other material approved by the Engineer.
2. Provide strapping material of adequate length to prevent restriction of trunk, branches, or stems and contact of staking or guying wire with tree trunk.

C. Wire: Provide minimum 17 gauge, rust inhibitive wire to resist breaking during high winds and natural weathering conditions.

D. Manufactured Staking System: Upon approval of the Engineer, manufactured staking systems may be used in lieu of stakes, wire, and trunk support strapping.

2.05 GUYING MATERIAL

A. Earth Anchors:

1. Steel auger type with looped end; minimum 3/4 inch diameter, 36 inch long anchor shank, with 5 inch minimum diameter anchor disk.

2. Driven style earth anchors with a minimum 1,000 pound capacity in normal soils.

B. Trunk Support Strapping: Comply with Section 32 93 00, 2.04, B.

C. Cable: 1/8 inch galvanized wire rope or equivalent cable with a minimum 1,500 pound capacity. Provide cable with ends clean and unfrayed.

D. Cable Clamps: Match size and strength of cable. Provide two for each end of cable.

E. Flagging Material: Brightly colored, minimum 12 square inches.

2.06 TREE PROTECTION

Install a correctly fitted mesh (corrugated or vinyl plastic) or corrugated or crepe paper, specifically manufactured for tree trunk protection, having qualities to resist insect infestation and to allow free air flow to trunk tissues, or similar material approved by the Engineer.

2.07 WATER

Provide water and watering equipment such as hoses, tanks, reels, bags or bladders, mobile equipment, nozzles, and sprinklers for the purpose of regular watering activities during the

establishment period. Provide water free of substances harmful to plant growth. No fertilizers, pesticides, or growth regulators will be used in the water.

2.08 TREE DRAINAGE WELLS

F. Porous Backfill Material: Comply with Iowa DOT Section 4131.

G. Engineering Fabric: Comply with Iowa DOT Article 4196.01.

2.09 HERBICIDE

Provide a granular pre-emergent herbicide as approved by the Engineer.

PART 3 - EXECUTION

3.01 ALLOWABLE PLANTING DATES

Install plant material during the following times:

A. Evergreen Plants: September 1 to September 30 and March 1 to April 30, but not after candles exceed 1 inch.

B. Deciduous Plants (Balled and Burlapped and Container): October 1 to November 30 and March 1 to May 15.

C. Deciduous Plants (Bare Root): In the spring prior to May 15.

D. Weather Restrictions: Planting may be conducted under unseasonable conditions, except in weather below 32°F or above 90°F. No variance from plant warranty or other requirements will be given for plants installed outside the specified periods.

3.02 PREPARATION

A. Provide notice to the Engineer 3 days prior to planting.

B. All plants will be inspected by the Engineer prior to planting. Plants may be inspected and approved at the place of growth by the Engineer for compliance with the specifications for quality, size, and variety. Such approval does not waive the right to reject any plant material after it has been delivered to the site and/or installed.

C. Provide barriers or fencing as approved by Engineer to protect the public from injury when planting installation is within the right-of-way.

3.03 LOCATION OF PLANTS

A. Mark the location of all plants with flags or lathe according to the contract documents. Mark trees individually. Stake the outline of bedded plants or shrub groups for the quantity on the plans without marking individual plants. The Engineer will approve the locations marked prior to excavation of planting pits.

B. Make field adjustments in plant locations where underground or overhead obstruction is encountered, or where changes have been made as approved by the Engineer.

3.04 EXCAVATION OF PLANTING PIT

A. Excavate the plant pit, centered at the location marks, cylindrical in shape with a diameter

3 times larger than ball or root condition, with sloped sides and flat bottom. Excavate plant pit to a depth to match the nursery grade of the root flare for all balled and container root systems with well-draining soils. Do not over excavate the pit for container or balled and burlapped plants. Excavate plant pit to a depth 6 inches deeper for bare-rooted systems.

B. Scarify sides of excavated pit.

C. If specified, following excavation of planting pit for all trees, fill the pit full of water; allow to stand (without adding water) for an 18 hour period to determine porosity of the soil.

D. If the soils are too impervious, provide a tree drainage well per SUDAS Figure 9030.103 or plant 2 to 3 inches above the surrounding grade, per SUDAS Figure 9030.101, as directed by the Engineer.

3.05 TREE DRAINAGE WELLS

Install drainage wells when specified in the contract documents or when directed by the Engineer due to the presence of impervious soils.

A. Locate the drainage well at the edge of the excavated planting pit.

B. Auger an 8 inch to 12 inch diameter hole to existing pervious soil or to a maximum depth of 10 feet. If pervious soil is encountered, extend hole a minimum of 12 inches into the pervious layer.

C. Fill the excavated hole with porous backfill material and cover the aggregate with engineering fabric.

D. Following completion of drainage well, fill the pit full of water; allow to stand for an 18 hour period to verify sufficient drainage exists. The Engineer will determine if the drainage is sufficient.

3.06 PLANTING

A. Bare Root Plants:

1. Remove all ties, ribbons, wrap, and other items except plant identification from the branch system.

2. Remove all root packing and prune broken roots to sound wood with clean cuts.

3. Build a firm cone-shaped mound of soil in the middle of the planting pit.

4. Place the plant centered, upright, plumb, and with desired orientation in the planting pit, with the root flare matching existing grade.

5. Spread and arrange roots in their natural position laterally away from the central trunk to prevent kinking or circling. Do not fold, crimp, or mat roots together.

6. Carefully place backfill material in layers, filling all voids and avoiding injury to the root system until two thirds of the planting pit is complete; fill the pit with water and allow the soil to settle.

7. Continue placing backfill material up to grade level. Water in the tree. Allow water

to completely soak into soil.

B. Balled and Burlapped and Container Plants:

1. Ensure root systems are moist at the time of planting.

2. Remove all ties and wrap from branch system, except plant identification.

3. Container Plants:
   a. Remove plant root system carefully from container prior to planting without disturbance to root systems.
   b. Inspect root system and cut any circled (girdled) roots.
   c. Place plants centered, upright, plumb, and with desired orientation in planting pit with the root flare matching existing grade.

4. Balled and Burlapped Plants:
   a. Place plants centered, upright, plumb, and with desired orientation in planting pit with the root flare at or slightly above existing grade or 2 to 3 inches above grade if in compacted clay or poorly drained soils.
   b. After plant placement, cut and remove the top 1/2 of the wire, burlap, and twine from root ball

5. Carefully place and lightly tamp a small amount of backfill material around the root ball base to stabilize the root ball.

6. Place loose excavated soil 2/3 of the depth of the planting pit. Water in the tree. Allow water to completely soak into soil.

7. Continue placing backfill material up to grade level. Lightly tamp but do not compact the soil around the plant. Water in a second time.

8. If specified, rototill soil in a 4 foot radius around the planting pit to break up compacted soil.

C. Planting on Slopes:

1. Place the top of the root flare at or slightly above the finished grade at the center of the planting pit.

2. For all plants planted on significant slope, form a saucer as a dam or shoulder on the downhill side to catch and hold water and to discourage erosion.

3.07 WATERING

A. Water each plant immediately after planting.

B. Water plants a minimum of 10 to 15 gallons per plant per week when less than 1 inch of precipitation is received in the immediate location. Apply sufficient water to soak the plant's root zone. Follow this watering procedure throughout the establishment period.

3.08 MULCHING

A. Dig edges of mulched areas to ensure the top of the mulch at the edge of the planting area matches the existing ground surface.

B. Place mulch 3 inches deep in the planting saucer within 2 calendar days of planting.

C. Mulch an area around tree trunks and shrub branch lines a minimum of 6 inches larger than the tree canopy.

D. Provide a continuous mulch area around plant groupings.

E. Following mulch placement, pull mulch back 6 inches from the base of all trees and shrubs to allow air circulation.

3.09 TREE PROTECTION

A. When specified in the contract documents, or when directed by the Engineer, protect the trunk of deciduous trees in the fall of the year in which the tree is planted.

B. Inspect the trunk for injuries and evidence of insect infestation prior to wrapping.

C. Protect trunk from the ground line to the height of the first branch. If plant has multiple stems, cover each stem separately.

D. Remove tree protection by April 1 of the next spring.

3.10 STAKING AND GUYING

A. General:

1. Maintain all plants in an upright and plumb condition.

2. Complete staking or guying by the end of the day in which they were installed for all single stem plants over 1 inch diameter.

3. Do not stake clump form plants and plants in paved pedestrian areas unless approved by the Engineer.

B. Staking:

1. Provide two stakes for each tree for trees 2 1/2 inches in diameter and smaller. Place one of the stakes on the southwest side of the tree, or as directed by the Engineer, and place the second stake directly opposite the first.

2. Provide three stakes for each tree for trees 2 1/2 to 4 inches in diameter. Locate one stake on the southwest side of the tree with remaining stakes equally spaced around the tree.

3. Locate stakes uniformly from the trunk of the tree at a distance equal to 1/4 to 1/3 of the height of the tree, or 2 feet minimum. Place stakes outside of the planting pit and within the mulch area.

4 Set posts vertically into unexcavated soil at a minimum 2 foot depth or until firm, providing a required post height above grade.

5. Attach wire with trunk protection to trunk at a minimum of 4 feet above grade or between one half and two thirds distance from finished grade to the top of the tree with slight slack in wire to allow for tree movement.

6. Secure wire to stakes at 6 inches from the top of the stake; mark all wire with flagging material.

7. Install manufactured staking system according to manufacturer's published recommendations.

C. Guying:

1. Provide three earth anchors and cables for evergreen trees 10 feet and taller and deciduous trees over 4 inches in diameter. Locate one anchor on the southwest side of the tree with remaining anchors equally spaced.

2. Locate the anchor a distance from the trunk equal to 1/3 of the tree height.

3. Attach the cable with a trunk protector to the trunk between 1/3 and 1/2 of the tree height, or near the lowest main branches for deciduous trees.

4. Screw an auger style anchor into unexcavated soil until only the looped top is exposed. Install driven style anchors a minimum of 2 1/2 feet into the soil.

5. Secure cable to anchor with slight slack in cable; mark all anchor cables with flagging material.

6. Install manufactured staking system according to the manufacturer's published recommendations.

D. Removal: Remove all staking and anchoring materials from all plants at the end of the 1 year establishment period and remove from site.

3.11 PRUNING

A. General:

1. Provide proper and sharp pruning tools to provide a clean cut without injuring the branch collar.

2. Prune in such a manner as to retain the natural shape of the plant. Do not prune the terminal leader of a plant. Leave no protruding stubs, and prune to the closest outward growing bud.

3. Plant materials incorrectly pruned will be rejected.

B. Deciduous Trees:

1. Prune broken, damaged, or otherwise defective branches. Remove all branches that may not develop properly. Also, eliminate narrow crotches or competing leaders.

2. Prune to develop an upright leader that will promote the symmetry of the tree. Prune flowering or specimen trees to develop their natural form.

3. Prune all trees in Class A sidewalks or other paved pedestrian areas to provide a 7 foot height clearance, unless otherwise directed by the Engineer.

C. Evergreen Trees and Shrubs: Remove dead and broken branches.

D. Deciduous Shrubs: Remove dead or irregular branches. Prune to develop their natural form.

3.12 CLEAN UP

A. Perform cleaning during installation and upon completion of work.

B. Remove all excess materials, trimmings, branches, soils, debris, and equipment from the site.

C. Repair any damage resulting from planting operations.

D. Clean all paved areas with a broom.

E. Remove all tags and labels from plants following acceptance by the Engineer.

3.13 ESTABLISHMENT AND WARRANTY PERIODS AND ACCEPTANCE

A. Establishment Period: The plant establishment period is 1 year after the installation is accepted by the Engineer. A plant inspection will be made by the Engineer prior to the expiration of the establishment period.

B. Warranty Period: If a plant warranty is specified in the contract documents, the 1 year warranty period begins immediately after the expiration of the 1 year establishment period. Inspection of plants will be made by Engineer at the end of the 1 year establishment period and again prior to the expiration of the warranty period.

C. Maintenance: Care for all plants during the establishment or warranty period as required to keep plants in a live, healthy growing condition.

1. Prune plants to maintain a desirable shape and to remove any dead or broken limbs.

2. Remove weeds and grasses from planting beds and mulch areas. Apply a pre-emergent herbicide to control weed growth when directed by the Engineer.

3. Water as required to enhance early root growth and maintain a moist soil.

4. Adjust stakes and ties to maintain plant in an upright and plumb condition.

5. Re-set settled plants to proper grades and position. Restore planting saucer and mulch; add backfill material and mulch as may be required.

6. Apply appropriate insecticides and fungicides necessary to maintain plants free of insects and disease.

D. Plant Condition: Ensure all plants are in a live, healthy, and growing condition both at the date of acceptance of the installation by the Engineer, at the end of the plant establishment period, and at the end of the warranty period.

E. Replacement: Replace all plants not found to be in a live, healthy, and growing condition during inspection at the 1 year establishment period and again at the warranty period (if specified) at no additional cost to the Contracting Authority.

7. Upon notice from Engineer, remove rejected plants from the site and replace with plant material of the same species and size as originally specified. Install replacement plants complying with the contract documents.

8. Plants damaged due to fire or flooding beyond the contractors control or ice storms, hail, tornados, or acts of vandalism do not require replacement.

END OF SECTION

SECTION 33 01 12

WATER TESTING AND DISINFECTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Pressure and Leak Testing of Water System

B. Disinfection of Potable Water Systems

1.02 DESCRIPTION OF WORK

Test and disinfect water mains, valves, fire hydrants, and appurtenances.

1.03 SUBMITTALS

Comply with General Provisions.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions, as well as the following:

A. Notify the Engineer two working days in advance of testing or disinfection operations to coordinate the operations.

B. The Engineer or his/her representative is required to be in attendance during testing or disinfection.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 DISINFECTION AGENT - CHLORINE

A. Liquid Chlorine complying with AWWA B300 and AWWA B301.

B. Sodium Hypochlorite complying with AWWA B300.

C. Calcium Hypochlorite complying with AWWA B300.

D. All disinfecting agents to be NSF 60 certified. Supply and store in the original container.

PART 3 - EXECUTION

3.01 GENERAL

Perform operations according to AWWA C651 in the sequence below. Successfully complete each operation specified in subsections 3.02 through 3.08 below before continuing to the next operation. The Jurisdiction will provide reasonable quantities of water for flushing and testing.

3.02 SEQUENCE OF TESTING AND DISINFECTION

A. Continuous-Feed or Slug Method (After Water Main Installation): The sequence of testing and disinfection may be modified with approval of the Engineer.

1. Perform initial flush.
2. Perform disinfection.
3. Flush after disinfection.
4. Perform pressure and leak testing.

B. Tablet Method (Concurrent with Water Main Installation): Use this method only if approved by the Engineer. Modify the procedure for flushing, disinfection, and pressure and leak testing as needed if tablet method is used.

1. Perform disinfection.
2. Flush after disinfection.
3. Perform pressure and leak testing.

3.03 INITIAL FLUSHING

A. Flushing:

1. Coordinate flushing with the Jurisdiction.
2. Flush pipe prior to disinfection using potable water.
3. Measure flushing velocity.
4. Obtain a minimum flushing velocity of 3 feet per second in the pipe to be disinfected.

B. Minimum Flushing Rate: According to AWWA C651, Table 3, based on 40 psi residual pressure (see table below).

Table 5030.01: Minimum Flushing Rate

Pipe Diameter (inches)	Flow Rate for Flushing (gpm)	Number of Taps[2]			Number of 2 1/2" Fire Hydrant Outlets[1]
		1"	1 1/2"	2"	
4	120	1	-	-	1
6	260	-	1	-	1
8	470	-	2	-	1
10	730	-	3	2	1
12	1,060	-	-	3	2

16	1,880	-	-	5	2

[1]With a 40 psi pressure in the main with the fire hydrant flowing to atmosphere, a 2 1/2 inch fire hydrant outlet will discharge approximately 1,000 gpm; and a 4 1/2 inch fire hydrant outlet will discharge approximately 2,500 gpm.
[2]Number of taps on pipe based on discharge through 5 feet of galvanized iron pipe with one 90° elbow.

C. **Property Protection:** Protect public and private property from damage during flushing operations.

3.04 PRESSURE AND LEAK TESTING

A. Remove debris from within the pipe. Clean and swab out pipe, if required.

B. Secure unrestrained pipe ends against uncontrolled movement.

C. Isolate new piping from the existing water system.

D. Fill and flush all new piping with potable water. Ensure all trapped air is removed.

E. Pressurize the new pipe to the test pressure at the highest point in the isolated system. Do not pressurize to more than 5 psi over the test pressure at the highest point in the isolated system.

F. Test and monitor the completed piping system at 1.5 times the system working pressure or 150 psi, whichever is greater, for 2 continuous hours.

G. If at any time during the test the pressure drops to 5 psi below the test pressure, repressurize the pipe by pumping in potable water in sufficient quantity to bring the pressure back to the original test pressure.

H. Accurately measure the amount of water required to repressurize the system to the test pressure.

I. Maximum allowable leakage

rate: $L = \frac{(S)(D)}{148{,}000}(P)^{0.5}$

Where:
L = allowable leakage, in gallons per hour S = length of pipe tested, in feet
D = nominal pipe diameter, in inches
P = average test pressure, in pounds per square inch

The following table assumes an average test pressure (P) of 150 psi and 1,000 feet of test section.

Table 5030.03: Maximum Allowable Leakage Rate

Pipe Diameter (inches)	Allowable Leakage Rate (gallons/hour/1,000 feet of pipe)
4	0.33
6	0.50
8	0.66
10	0.83
12	0.99
14	1.16

16	1.32
18	1.49
20	1.66
24	1.99
30	2.48
36	2.98

J. If the average measured leakage per hour exceeds the maximum allowable leakage rate, repair and retest the water main.

K. If the measured pressure loss does not exceed 5 psi, the test will be considered acceptable.

L. Repair all visible leaks regardless of the amount of leakage.

3.05 DISINFECTION

A. General:

1. Disinfect according to AWWA C651. The tablet method contained in AWWA C651 is not to be used unless approved by the Engineer.

2. Keep piping to be chlorinated isolated from lines in service and from points of use.

3. Coordinate disinfection and testing with the Engineer.

B. Procedure:

1. Induce a flow of potable water through the pipe.

2. Introduce highly chlorinated water to the pipe at a point within 5 pipe diameters of the pipe's connection to an existing potable system, or within 5 pipe diameters of a closed end, if there is no connection to an existing system.

3. Introduce water containing a minimum of 25 mg/L free chlorine until the entire new pipe contains a minimum of 25 mg/L free chlorine.

4. Retain chlorinated water in the pipe for at least 24 hours and no more than 48 hours.

3.06 FINAL FLUSHING

A. Flush pipe using potable water until chlorine residual equals that of the existing potable water system.

B. Dispose of chlorinated water to prevent damage to the environment. Dechlorinate highly chlorinated water from testing before releasing into the ground or sewers. Obtain Jurisdiction approval prior to flushing activities.

1. Check with the local sewer department for the conditions of disposal to the sanitary sewer.

2. Chlorine residual of water being disposed will be neutralized by treating with one of the chemicals listed in the following table.

Table 5030.02: Amounts of Chemicals Required to Neutralize Various Residual Chlorine Concentrations in 100,000 Gallons of Water

Residual Chlorine Concentration mg/L	Sulfur Dioxide (SO_2) lb	Sodium Bisulfite ($NaHSO_3$) lb	Sodium Sulfite (Na_2SO_3) lb	Sodium Thiosulfate ($Na_2S_2O_3 + 5H_2O$) lb	Ascorbic Acid ($C_6O_8H_6$) lb
1	0.8	1.2	1.4	1.2	2.1
2	1.7	2.5	2.9	2.4	4.2
10	8.3	12.5	14.6	12.0	20.9
50	41.7	62.6	73.0	60.0	104

3.07 BACTERIA SAMPLING

Test water mains according to AWWA C651, except as modified below:

A. Collect samples every 1,200 feet of new water main plus one set from the end of the line and at least one from each branch greater than one pipe length. If trench water entered the new main during construction, or if excessive quantities of dirt and debris entered the main, reduce the sampling interval to every 200 feet of new main.

B. Collect samples according to one of the following methods as directed by the Engineer:

1. Collect an initial set of samples after flushing and then an additional set after a minimum of 24 hours without any water use. The engineer may reduce the sampling interval to 16 hours.

2. Allow water to sit in the new main for a minimum of 16 hours after flushing without any water use. Collect an initial set of samples and allow the sampling ports to run for a minimum of 15 minutes. Collect a second set of samples from the sampling ports.

3.08 RE-DISINFECTION

If the initial disinfection fails to produce satisfactory bacteriological samples, flush the main again and reinitiate the sampling process. If check samples show the presence of coliform organisms, re-chlorinate the main prior to flushing and sampling until satisfactory results are obtained.

3.09 PUTTING WATER MAIN IN SERVICE

Put the completed water system in service only after both sets of bacterial samples have passed and obtaining permission from the Jurisdiction.

END OF SECTION

SECTION 33 14 16

WATER MAIN AND APPURTENANCES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Pipe

B. Fittings

C. Special Fittings

D. Pipeline Accessories

1.02 DESCRIPTION OF WORK

Construct water mains and building service pipes.

1.03 SUBMITTALS

Comply with General Provisions, as well as the following: Submit product information

sheet for joint restraint system to be used.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions, as well as the following:

Remove pipe and fittings contaminated with mud and surface water from the site; do not use in construction unless thoroughly cleaned, inspected, and approved by the Engineer.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 WATER MAIN

A. Polyvinyl Chloride (PVC) Pipe: Comply with AWWA C900 with ductile iron pipe equivalent outside diameters.

1. **Minimum Wall Thickness:**
   a. **4 inch through 24 inch sizes:** DR 18.
   b. **Sizes over 24 inch:** As specified in the contract documents.

2. **Joint Type:** Use push-on joint type, except as otherwise specified in the contract documents or as authorized by the Engineer.
   a. **Push-on:** According to AWWA C900.
   b. **Integral Restrained Joint:** AWWA C900 pipe with restraining system manufactured integrally into pipe end.
   c. **Mechanical Restrained Joint:** Ductile iron mechanical device designed for joint restraint of AWWA C900 pipe complying with the requirements of ASTM F 1674.

3. **Markings on Pipe:**
   a. Name of manufacturer.
   b. Size and class.
   c. Spigot insertion depth gauge.
   d. National Sanitation Foundation (NSF) seal.

B. Ductile Iron Pipe (DIP):

1. **Minimum Thickness Class:**
   a. **4 inch through 24 inch sizes:** Special thickness Class 52 according to AWWA C151.
   b. **Sizes over 24 inches:** As specified in the contract documents.

2. **Cement-mortar Lined:** According to AWWA C104 with seal coat.

3. **External Coating:** Seal coat according to AWWA C151.

4. **Joint Type:** Use push-on type, unless otherwise specified in the contract documents or as authorized by the Engineer.
   a. **Push-on:** According to AWWA C111.
   b. **Mechanical:** According to AWWA C111.
   c. **Restrained, Buried:** Pipe manufacturer′s standard field removable system.
   d. **Restrained, in Structures:** Restraining gland, flanged or grooved/shouldered.
   e. **Flanged:** According to AWWA C111.
   f. **Grooved/Shouldered:** According to AWWA C606.
   g. **Gaskets:** According to AWWA C111.

5. **Markings on Pipe:**
   a. Name of manufacturer.
   b. Size and class.
   c. Spigot insertion depth gauge.

2.02 BOLTS FOR WATER MAIN AND FITTINGS

Use corrosion resistant bolts.

A. Tee-bolts and Hexagonal Nuts for Mechanical Joints:

1. High-strength, low-alloy steel manufactured according to AWWA C111.

2. Provide ceramic-filled, baked-on, fluorocarbon resin coating for bolts and nuts.

3. Include factory-applied lubricant that produces low coefficient of friction for ease of installation.

B. Other Bolts and Nuts:

1. Stainless steel.

2. Ductile iron.

3. Zinc, zinc chromate, or cadmium plated.

2.03 FITTINGS

A. For DIP and PVC Pipe: Comply with AWWA C110 (ductile iron or gray iron) or AWWA C153 (ductile iron).

1. Joint Type:
- a. For pipe sizes 16 inches and less, use mechanical joint complying with AWWA C111.
- b. For pipe sizes greater than 16 inches, use restrained mechanical joint system. Provide follower gland using breakaway torque bolts to engage thrust restraint.
  - 1) Minimum pressure rating same as connecting pipe. For fittings between dissimilar pipes, the minimum pressure rating is the lesser of the two pipes.
  - 2) Suitable for buried service.
  - 3) Joint restraint system to be field installable, field removable, and re-installable.
- c. Use of alternate restraint systems must be approved by the Engineer.

2. Lined: Cement mortar lined according to AWWA C104 with seal coat or protective fusion bonded coatings per AWWA C116.

3. Wall Thickness: Comply with AWWA C153.

4. Gaskets: Comply with AWWA C111.

B. Flange Adapter:

1. Body: Ductile iron complying with ASTM A 536.

2. End Rings (Follower Rings): Ductile iron complying with ASTM A 536.

3. Gaskets: New rubber compounded for water service and resistant to permanent set.

4. Bolts and Nuts: High strength, low alloy corrosion resistant steel or carbon steel bolts complying with ASTM A 307.

C. Pipe Coupling:

1. Center Sleeve (Center Ring): Steel pipe or tubing complying with ASTM A 53 or ASTM A 512, or formed carbon steel with a minimum yield of 30,000 psi.

2. End Ring (Follower Ring): Ductile iron complying with ASTM A 536, or steel meeting or exceeding the requirements of ASTM A 576, grade 1010-1020.

3. Gaskets: New rubber compounded for water service and resistant to permanent set.

4. Bolts and Nuts: High strength, low alloy corrosion resistant steel.

2.04 CONCRETE THRUST BLOCKS

A. Use Iowa DOT Class C concrete.

B. Comply with the contract documents for dimensions and installation of thrust blocks. Comply with SUDAS Figure 5010.101.

C. Use for all pipe sizes 16 inches in diameter or smaller or when specified.

2.05 PIPELINE ACCESSORIES

A. Polyethylene Wrap:

1. Comply with AWWA C105.

2. Provide tubes or sheets with 8 mil minimum thickness.

B. Tracer System: Comply with SUDAS Figure 5010.102.

1. **Tracer Wire:**
   a. **Open Cut:**
      1) **Solid Single Copper Conductor:**
         a) **Size:** #12 AWG
         b) **Insulation Material:** Linear low-density polyethylene (LLDPE) insulation suitable for direct burial applications
         c) **Insulation Thickness:** 0.030 inches, minimum
         d) **Tensile Strength:** 150 pounds, minimum
         e) **Operating Voltage:** Rated for 30 volts
      2) **Bimetallic Copper Clad Steel Conductor:**
         a) **Size:** #14 AWG
         b) **Rating:** Direct burial
         c) **Operating Voltage:** Rated for 30 volts
         d) **Conductivity:** 21%
         e) **Copper Cladding:** 3% of conductor diameter, minimum
         f) **Insulation Material:** High density, high molecular weight polyethylene
         g) **Insulation Thickness:** 0.030 inches, minimum
         h) **Tensile Strength:** 175 pounds, minimum
   b. **Directional Drilling/Boring:**
      1) **Bimetallic Copper Clad Steel Conductor:**
         a) **Size:** #12 AWG
         b) **Rating:** Direct burial
         c) **Operating Voltage:** Rated for 30 volts
         d) **Conductivity:** 21%
         e) **Copper Cladding:** 3% of conductor diameter, minimum
         f) **Insulation Material:** High density, high molecular weight polyethylene
         g) **Insulation Thickness:** 0.045 inches, minimum
         h) **Tensile Strength:** 1,100 pounds, minimum

2. **Ground Rod:** 3/8 inch diameter, 60 inch steel rod uniformly coated with metallically bonded electrolytic copper.

3. **Ground-rod Clamp:** High-strength, corrosion-resistant copper alloy.

4. **Splice Kit:** Inline resin splice kit with split bolt (1 kV and 5 kV) for use with single conductor and unshielded cable splices in direct bury and submersible applications.

5. **Tracer Wire Station:** Comply with the contract documents.

2.06 SPECIAL GASKETS

A. For soils contaminated with gasoline, use neoprene or nitrile gaskets.

B. For soils contaminated with volatile organic compounds, use nitrile or fluorocarbon gaskets.

C. For other soil contaminants, contact the Engineer for the required gasket.

2.07 WATER SERVICE PIPE AND APPURTENANCES

A. Controlling Standards: Local plumbing and fire codes.

B. Materials (as allowed by Jurisdiction or specified in contract documents)**:**

1. **Copper Pipe:**
   a. Comply with ASTM B 88.
   b. Wall Thickness: Type K.

2. **DIP:** As specified in Section 33 14 16, 2.01. Polyethylene wrap is required.

3. **PVC Pipe:** ASTM D 1785, Schedule 80 or ASTM D 2241, SDR 21. Provide solvent weld joints for all pipes.

4. **Brass Pipe:** Red, seamless, according to ASTM B 43.

5. **Polyethylene Pipe:** Class 200, according to AWWA C901.

C. Corporations, Stops, and Stop Boxes: Contact the Jurisdiction for requirements.

2.08 NON-SHRINK GROUT

Comply with Iowa DOT Materials I.M. 491.13.

2.09 CASING PIPE

Comply with Section 31 23 34.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

A. General:

1. Do not use deformed, defective, gouged, or otherwise damaged pipes or fittings.

2. Keep trench free of water. Clean pipe interior prior to placement in the trench.

3. Install pipe with fittings and valves to the lines and grades specified in the contract documents.

4. Clean joint surfaces thoroughly and apply lubricant approved for use with potable water and recommended by the manufacturer.

5. Push pipe joint to the indication line on the spigot end of the pipe before making any

joint deflections.

6. Limit joint deflections to one degree less than pipe manufacturer′s recommended maximum limit.

7. Tighten bolts in a joint evenly around the pipe.

8. Install concrete thrust blocks on all fittings 16 inches in diameter or smaller (comply with SUDAS Figure 5010.101). For fittings larger than 16 inches, install restrained joints, and when specified in the contract documents, also install concrete thrust blocks.

9. Keep exposed pipe ends closed with rodent-proof end gates at all times when pipe installation is not occurring.

10. Close the ends of the installed pipe with watertight plugs during nights and non-working days.

11. Do not allow any water from the new pipeline to enter the existing distribution system piping until testing and disinfection are successfully completed.

B. Trenched:

1. Excavate trench and place pipe bedding and backfill material as specified in Section 31 23 33.

2. Provide uniform bearing along the full length of the pipe barrel. Provide bell holes.

C. Trenchless: Comply with Section 31 23 34.

3.02 ADDITIONAL REQUIREMENTS FOR DIP INSTALLATION

A. Utilize full-length gauged pipe for field cuts. Alternatively, use a MJ gland or other approved method to field-gauge pipe selected for cutting to verify the outside diameter is within allowable tolerances.

B. Cut the pipe perpendicular to the pipe barrel. Do not damage the cement lining. Bevel cut, file, or grind the ends for push-on joints according to the manufacturer's recommendations.

C. Encase all pipe, valves, and fittings with polyethylene wrap according to Section 33 14 16, 3.05.

D. Install pipe according to AWWA C600, except as modified herein.

3.03 ADDITIONAL REQUIREMENTS FOR PVC PIPE INSTALLATION

A. Cut the pipe perpendicular to the pipe barrel. Deburr and bevel cut spigot end of the pipe barrel to match factory bevel. Re-mark the insertion line.

B. When connecting to shallow-depth bells, such as on some cast iron fittings or valves, cut the spigot end square to remove factory bevel. Deburr the end and form a partial bevel on the end.

C. Install pipe according to AWWA C605, except as modified herein.

3.04 POLYETHYLENE ENCASEMENT INSTALLATION

A. Apply polyethylene encasement to buried ductile iron pipe and to buried fittings, fire hydrants, and appurtenances. The polyethylene encasement is used to prevent contact between the pipe and the bedding material, but need not be airtight or watertight.

B. Install polyethylene encasement according to AWWA C105, using tubes or flat sheets, and pipe manufacturer's recommendations.

C. Do not expose the polyethylene encasement to sunlight for long periods before installation.

D. Remove all lumps of clay, mud, cinders, etc. on the pipe surface before encasing the pipe. Take care to prevent soil or bedding material from becoming trapped between the pipe and polyethylene.

E. Lift polyethylene-encased pipe with a fabric-type sling or padded cable.

F. Secure and repair encasement material using polyethylene tape, or replace as necessary.

3.05 TRACER SYSTEM INSTALLATION

A. Install with all buried water main piping. Comply with SUDAS Figure 5010.102 for tracer wire installation.

B. Begin and terminate the system at all connections to existing mains.

C. Install wire continuously along the lower quadrant of the pipe. Do not install wire along the bottom of the pipe. Attach wire to the pipe at the midpoint of each pipe length; use 2 inch wide, 10 mil thickness polyethylene pressure sensitive tape.

D. Install splices only as authorized by the Engineer. Allow the Engineer to inspect all below- grade splices of tracer wire prior to placing the backfill material.

E. Install ground rods adjacent to connections to existing piping and at locations specified in the contract documents or as directed by the Engineer.

F. Bring two wires to the surface at each fire hydrant location and terminate with a tracer wire station (comply with SUDAS Figure 5010.102).

G. Final inspection of the tracer system will be conducted at the completion of the project and prior to acceptance by the owner. Verify the electrical continuity of the system. Repair discontinuities.

3.06 CONFLICTS

A. Horizontal Separation of Gravity Sewers from Water Mains:

1. **Sanitary and Combined Sewers:**
   a. Separate gravity sanitary and combined sewer mains from water mains by a horizontal distance of at least 10 feet unless:
      1) The top of a sewer main is at least 18 inches below the bottom of the water main, and
      2) The sewer is placed in a separate trench or in the same trench on a bench of undisturbed earth at a minimum horizontal separation of 3 feet from the water main.

b. Maintain the maximum feasible separation distance in all cases. When it is impossible to obtain the required horizontal clearance of 3 feet and a vertical clearance of 18 inches between sewers and water mains, provide a linear separation of at least 2 feet and one of the following:
   1) Construct sanitary and combined sewers of water main materials meeting the requirements of Section 33 14 16, 2.01.
   2) Enclose the water main in a watertight casing pipe with an evenly spaced annular gap and watertight end seals.

2. **Storm Sewers:** Separate storm sewers and water mains by at least 10 feet measured edge-to-edge unless it is impossible to do so. When impossible to maintain a 10 feet horizontal separation, maintain a minimum separation of 3 feet and utilize one of the following within 10 feet measured edge-to-edge:
   a. Construct the water main of ductile iron pipe with gaskets impermeable to hydrocarbons.
   b. Enclose the water main in a watertight casing pipe with evenly spaced annular gap and watertight end seals.
   c. Construct storm sewer pipe of water main materials.
   d. Construct storm sewers of reinforced concrete pipe with gaskets manufactured according to ASTM C 443.

B. Horizontal Separation of Water Mains from Sanitary and Combined Sewer Manholes: Ensure water pipes do not pass through or come in contact with any part of a sanitary or combined sewer manhole. Maintain a minimum horizontal separation of 3 feet.

C. Horizontal Separation of Sewer Force Mains from Water Mains: Separate sewer force mains and water mains by a horizontal distance of at least 10 feet unless:

1. The force main is constructed of water main materials meeting a minimum pressure rating of 150 psi and the requirements of Section 33 14 16, 2.01 and

2. The sewer force main is laid at least 4 linear feet from the water main.

D. Vertical Separation of Sewers and Water Main Crossovers:

1. **Sanitary and Combined Sewers:**
   a. Vertically separate sanitary and combined sewers crossing under water mains by at least 18 inches when measured from the top of the sewer to the bottom of the water main. If physical conditions prohibit the separation, do not place the sewer closer than 6 inches below a water main or 18 inches above a water main. Maintain the maximum feasible separation distance in all cases. Ensure the sewer and water pipes are adequately supported and have watertight joints. Use a low permeability soil for backfill material within 10 feet of the point of crossing.
   b. Where the sanitary sewer crosses over or less than 18 inches below a water main, utilize one of the following within 10 feet measured edge-to-edge horizontally, centered on the crossing:
      1) Construct sanitary and combined sewers of water main material meeting the requirements of Section 33 14 16, 2.01.
      2) Enclose the water main in a watertight casing pipe with an evenly spaced annular gap and watertight end seals.

2. **Storm Sewers:**
   a. Vertically separate storm sewers from water mains by at least 18 inches measured between the outside edges of the water main and the storm sewer. Maintain the maximum feasible separation distance in all cases. Ensure the

sewer and water pipes are adequately supported. Use a low permeability soil for backfill material within 10 feet of the point of crossing.

b. When impossible to maintain an 18 inch vertical separation when the water main crosses over the storm sewer, maintain a minimum vertical separation of 6 inches and utilize one of the following within 10 feet measured edge-to-edge centered on the crossing:
   1) Construct the water main of ductile iron pipe with gaskets impermeable to hydrocarbons.
   2) Enclose the water main in a watertight casing pipe with evenly spaced annular gap and watertight end seals.
   3) Construct storm sewer pipe of water main materials.
   4) Construct storm sewers of reinforced concrete pipe with gaskets manufactured according to ASTM C 443.

3.07 TRANSITIONS IN PIPING SYSTEMS

Where the specified material of a piping system entering or exiting a structure changes, make the change at the outside of the structure wall, beyond any wall pipe or wall fitting required, unless otherwise specified.

3.08 STRUCTURE PENETRATIONS

A. Wall Pipes:

1. Install where pipes penetrate and terminate at a wall or floor surface of a concrete structure, or where the pipe protrudes through the concrete wall or floor and the protrusion is otherwise unsupported.

2. Provide a waterstop flange near the center of the embedment length. The waterstop is to be cast integrally with the wall pipe, or fully welded to it around the pipe circumference.

B. Wall Sleeves:

1. Install where a pipe passes through a structure wall.

2. Sleeves in concrete walls are to be supplied with a waterstop collar, fully welded, and cast-in-place in the concrete.

3.09 WATER SERVICE STUB

A. Install water service pipe, corporations, stops, and stop boxes according to local Jurisdiction requirements.

B. Install 1 inch and smaller corporation valves tapped at 45 degrees above horizontal at a minimum distance of 18 inches from pipe bell or other corporation. Install 1 1/2 inch and 2 inch corporation valves tapped horizontal a minimum distance of 24 inches from pipe bell or other corporation.

C. Construct trench and place backfill material according to Section 31 23 33.

3.10 WATER MAIN ABANDONMENT

Verify with the Engineer that all services are no longer using the main to be abandoned.

A. For Each Pipe to be Abandoned by Capping:

1. Close valves and remove valve boxes as specified in the contract documents.

2. Construct thrust blocks on each end of the active pipes according to SUDAS Figure 5010.101.

3. Cut pipe to be abandoned a minimum of 5 feet from the closed valve on each end of the active pipes, leaving a minimum of 12 inches of pipe exposed beyond the thrust block.

4. Remove a minimum of 3 feet of the pipe to be abandoned.

5. Install a MJ cap using a retaining gland according to SUDAS Figure 5010.101 on the end of each pipe to be abandoned and each active pipe.

B. For Each Pipe to be Abandoned by Filling:

1. Close valves and remove valve boxes as specified in the contract documents.

2. Construct thrust blocks on each end of the active pipes according to SUDAS Figure 5010.101.

3. Cut pipe to be abandoned a minimum of 5 feet from the closed valve on each end of the active pipes, leaving a minimum of 12 inches of pipe exposed beyond the thrust block.

4. Remove a minimum of 3 feet of the pipe to be abandoned.

5. Install a MJ cap using a retaining gland according to SUDAS Figure 5010.101 on each pipe to be abandoned and each active pipe.

6. Fill the pipe to be abandoned by pumping with flowable mortar, foamed cellular concrete, or CLSM complying with Section 31 23 33.

3.11 WATER MAIN REMOVAL

Verify with the Engineer that all services are no longer using the main and have been disconnected from the main to be removed.

A. Close valves as specified in the contract documents.

B. Construct thrust block on each end of the active pipes according to SUDAS Figure 5010.101.

C. Cut pipe to be removed a minimum of 5 feet from the closed valve on each end of the active pipes leaving a minimum of 12 inches of pipe exposed beyond the thrust block.

D. Install a MJ cap using a retaining gland according to SUDAS Figure 5010.101 at the end of each active pipe.

E. Remove and dispose of water main pipe. Furnish, place, and compact backfill material.

3.12 TESTING AND DISINFECTION

Test and disinfect according to Section 33 01 12.

END OF SECTION

SECTION 33 14 23

WATER UTILITY DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Butterfly Valves

B. Gate Valves

C. Tapping Valve Assemblies

D. Fire Hydrant Assemblies

E. Flushing Devices (Blowoffs)

F. Valve Boxes

1.02 DESCRIPTION OF WORK

Install valves, fire hydrants, and appurtenances for water mains.

1.03 SUBMITTALS

Comply with General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions, as well as the following:

Remove valves, fire hydrants, and appurtenances contaminated with mud and surface water from the site. Do not use in construction unless thoroughly cleaned, inspected, and approved by the owner.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 VALVES

A. General:

1. **Valve Body:** Manufacturer′s name and pressure rating cast on valve body.

2. **Direction of Opening:** The opening direction is counterclockwise as viewed from the top, unless otherwise specified in the contract documents or as directed by the Jurisdiction.

3. **Joints:**
   a. For buried installations, use mechanical joints per AWWA C111. Comply with Section 5010 for joint nuts and bolts.
   b. For installation within structures, flanged with dimensions and drillings according to AWWA C110 or ANSI B16.1 class 125.

B. Gate Valves:

1. **Standards:** Comply with AWWA C509 (gray iron or ductile iron) or AWWA C515 (ductile iron) and NSF 61.

2. **Stem Seals:** Double O-rings permanently lubricated between seals. Lubricant certified for use in potable water.

3. **External Bolts and Hex Nuts:** Stainless steel according to ASTM A 240, Type 304.

C. Butterfly Valves:

1. **Standards:** Comply with AWWA C504 class 150B (gray iron or ductile iron) and NSF 61.

2. **Stem:** Stainless steel according to ASTM A 240, Type 304, turned, ground, and polished.

3. **For Seat on Body Valves:**
   a. Disc: Ductile iron or gray iron with plasma applied nickel-chromium edge or stainless steel edge according to ASTM A 240, Type 316, and mechanically fixed stainless steel pins.
   b. Seat: Synthetic rubber compound mechanically retained to the body.

4. **For Seat on Disc Valves:**
   a. Disc: Ductile iron according to ASTM A 536 with synthetic rubber compound seat mechanically retained to the disc.
   b. Seat: Continuous Type 316 stainless steel seat.

5. **External Bolts and Hex Nuts:** Stainless steel according to ASTM A 240, Type 304.

D. Tapping Valve Assemblies:

1. **Tapping Valve:** Gate valve complying with AWWA C509 or AWWA C515.

2. **Sleeve:**
   a. Minimum 14 gauge.
   b. Stainless steel according to ASTM A 240, Type 304.
   c. Working pressure 150 psi.
   d. Must fully surround pipe.
   e. Flanged with dimensions and drillings according to AWWA C110 or ANSI B16.1 class 125.

3. **Minimum Sleeve Length:** Comply with the following table.

Table 5020.01: Minimum Sleeve Length

Outlet Flange Size	Minimum Sleeve Length
4”	15”
6”	15”
8”	20”
10”	25”
12”	25”
Over 12”	As approved by the Engineer

4. **Gasket:**
   a. To completely surround pipe.
   b. Minimum thickness 0.125 inch.
   c. Use nitrile rubber.

5. **Outlet Flange:**
   a. Stainless steel complying with ASTM A 240, Type 304.
   b. ANSI B16.1, 125 pound pattern.

6. **Hex Nuts and Bolts:** Stainless steel complying with ASTM A 240, Type 304.

7. **Tapping Valve Assemblies:** Use only where specified in the contract documents.

2.02 FIRE HYDRANT ASSEMBLY

A. **Material:** Comply with AWWA C502.

B. **Manufacturers:** As allowed by the Jurisdiction or as specified in the contract documents.

C. **Features:**

1. **Breakaway Items:** Stem coupling and flange.
2. **Inlet Nominal Size:** 6 inch diameter.
3. **Inlet Connection Type:** Mechanical joint.
4. **Hose Nozzles:** Two, each 2 1/2 inches in diameter.
5. **Direction of Opening:** Counterclockwise, unless otherwise specified.
6. **Items to be Specified:** The following items will be specified by the Jurisdiction or in the contract documents.
   a. Operating nut.
   b. Pumper nozzle.
   c. Nozzle threads.
   d. Main valve nominal opening size.

D. **Painting:**

1. Shop coating according to AWWA C502.

2. Above grade exterior coating type and color will be selected by the Engineer.

E. **External Bolts and Hex Nuts:** Stainless steel according to ASTM A 193, Grade B 8.

F. **Gate Valve:** Comply with Section 33 14 23, 2.01.

G. **Pipe and Fittings:** Comply with Section 33 14 16.

2.03 APPURTENANCES

A. Flushing Device (Blowoff): As specified in the contract documents.

B. Valve Box:

1. **Applicability:** For all buried valves.

2. **Manufacturer:** As allowed by the Jurisdiction or specified in the contract documents.

3. **Type:**
   a. In paved areas, use a slide type.
   b. In all other areas, use a screw extension type.

4. **Material:** Gray iron.

5. **Cover:** Gray iron, labeled "WATER"

6. **Wall Thickness:** 3/16 inch, minimum.

7. **Inside Diameter:** 5 inches, minimum.

8. **Length:** Adequate to bring top to finished grade, including valve box extensions, if necessary.

9. **Factory Finish:** Asphalt coating.

10. **Valve Box Centering Ring:** Include in installation.

C. Valve Stem Extension: For all buried valves, provide as necessary to raise 2 inch operating nut to within 3 feet of the finished grade. Stem diameter according to valve manufacturer's recommendations, but not less than 1 inch.

PART 3 - EXECUTION

3.01 GENERAL

A. Install according to the contract documents.

B. Apply polyethylene wrap to all iron pipe, valves, fire hydrants, and fittings.

C. Set tops of valve boxes to finished grade, unless otherwise directed by the Engineer.

D. Check the working order of all valves by opening and closing through entire range. Before opening the valves, check with the Jurisdiction on operating requirements.

E. Test and disinfect all valves, fire hydrants, and appurtenances as components of the completed water main according to Section 33 01 12.

3.02 FLUSHING DEVICE (BLOWOFF)

Install and construct as specified in the contract documents.

3.03 FIRE HYDRANT

A. Install according to SUDAS Figure 5020.201. Ensure a 3 foot clear space around the circumference of the fire hydrant. Place anchor tee and hydrant in the locations specified in the contract documents.

B. If the fire hydrant valve is positioned adjacent to the water main, attach it to an anchor tee.

C. If the fire hydrant valve is positioned away from the water main, restrain all joints between the valve and water main.

D. Fire Hydrant Depth Setting:

1. Use adjacent finished grade to determine setting depth.

2. Set bottom of breakaway flange between 2 and 5 inches above finished grade.

3. If finished grade is not to be completed during the current project, consult with the Engineer for proper setting depth.

E. Coordinate installation with tracer wire installation.

F. Orient fire hydrant nozzles parallel with or at right angles to the curb, with the pumper nozzle facing the curb. Set hydrants having two hose nozzles 90 degrees apart with each nozzle facing the curb at an angle of 45 degrees or as directed by the Engineer.

3.04 ADJUSTMENT OF EXISTING VALVE BOX OR FIRE HYDRANT

A. Minor Valve Box Adjustment: For existing adjustable boxes that have sufficient adjustment range to bring to finished grade, raise or lower valve box to finished grade.

B. Valve Box Extension: For existing valve boxes that cannot be adjusted to finished grade, install valve box extensions as required.

C. Valve Box Replacement: For existing valve boxes that cannot be adjusted to finished grade, remove and replace the valve box.

D. Fire Hydrant Adjustment:

1. Add extension barrel sections and stems as necessary to set existing fire hydrant at finished grade.

2. Paint exterior of new barrel section to match existing fire hydrant unless otherwise specified.

END OF SECTION

SECTION 33 31 13

SANITARY UTILITY PIPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Sanitary Sewer Gravity Mains

B. Sanitary Sewer Force Mains

C. Sanitary Sewer Services

1.02 DESCRIPTION OF WORK

A. Construct sanitary sewer gravity and force mains.

B. Construct or relocate building sanitary sewer services, stubs, and connections.

1.03 SUBMITTALS

Comply with General Provisions.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 SANITARY SEWER (Gravity Mains)

A. Solid Wall Polyvinyl Chloride Pipe (PVC) 8 inch to 15 inch:

1. Comply with ASTM D 3034, SDR 26, unless SDR 35 is specified.

2. Pipe stiffness per ASTM D 2412.
   a. SDR 26: Minimum pipe stiffness of 115 psi.
   b. SDR 35: Minimum pipe stiffness of 46 psi.

3. PVC plastic meeting ASTM D 1784, Cell Classification 12454 or 12364.

4. Integral bell and spigot joints with elastomeric seals complying with ASTM D 3212 and ASTM F 477.

B. Solid Wall Polyvinyl Chloride Pipe (PVC) 18 inch to 27 inch:

1. Comply with ASTM F 679.

2. Pipe stiffness per ASTM D 2412, 46 psi.

3. PVC plastic meeting ASTM D 1784, Cell Classification 12454 or 12364.

4. Integral bell and spigot joints with elastomeric seals complying with ASTM D 3212 and ASTM F 477.

C. Corrugated Polyvinyl Chloride Pipe (PVC) 8 inch to 36 inch:

1. Comply with ASTM F 949, smooth interior, corrugated exterior.

2. Pipe stiffness per ASTM D 2412.
   a. 8 inch to 10 inch: Minimum pipe stiffness of 115 psi, unless 46 psi is specified.
   b. 12 inch to 36 inch: Minimum pipe stiffness of 46 psi.

3. PVC resin meeting ASTM D 1784, Cell Classification 12454.

4. Integral bell and spigot joints with elastomeric seals complying with ASTM D 3212 and ASTM F 477.

D. Closed Profile Polyvinyl Chloride Pipe (PVC) 21 inch to 36 inch:

1. Comply with ASTM F 1803.

2. Pipe stiffness per ASTM D 2412, 46 psi.

3. PVC plastic meeting ASTM D 1784, Cell Classification 12364.

4. Integral bell and spigot joints with elastomeric seals complying with ASTM D 3212 and ASTM F 477.

E. Polyvinyl Chloride Composite Pipe (truss type PVC) 8 inch to 15 inch:

1. Comply with ASTM D 2680. Pipe constructed with truss-type structure between inner and outer PVC walls with voids filled with lightweight concrete.

2. Pipe stiffness per ASTM D 2412, 200 psi.

3. PVC plastic meeting ASTM D 1784, Cell Classification 12454.

4. Integral bell and spigot joints with elastomeric seals complying with ASTM D 3212 and F 477.

F. Reinforced Concrete Pipe (RCP) 18 inch to 144 inch:

1. General:
   a. Comply with ASTM C 76 (AASHTO M 170).
   b. Minimum Class IV (3000D), Wall B.
   c. Tongue and groove joints.
   d. Rubber O-ring or profile gasket flexible joint complying with ASTM C 443.

2. Pipe Lining:
   a. Epoxy Coal Tar:
      1) Coat interior pipe barrel and all joint surfaces with two-component coal-tar

epoxy- polyamide black paint or approved equal.

2) Lining Material: Steel Structures Painting Council (SSPC) Specification No. 16, Table 1.
   a) Minimum epoxy resin content 34% to 35% by dry film weight.
   b) Minimum sag resistance 40 mils.
   c) Minimum solids 80% by volume.
3) Apply according to lining material manufacturer's recommendations.

b. PVC:
   1) Minimum thickness of 0.65 inch.
   2) Locking extensions extruded from the same material as the liner a minimum of 0.375 inches tall spaced a maximum of 2.5 inches.
   3) Liner to cover the entire interior of the concrete pipe.
   4) Minimum tensile strength of liner is 2200 psi with a minimum elongation of 200% at breaking.
   5) Meet EPA 9090 for chemical resistance.
   6) Free of cracks, cleavages, pinholes, or other defects.
   7) Joint sealer strip to be from the same material as the liner.

c. HDPE:
   1) Minimum thickness of 0.064 inches according to ASTM D5199.
   2) Minimum density of 0.90 g/cm^3.
   3) Meet EPA 9090 for chemical resistance.
   4) Locking extensions made from the same material as the liner with minimum pullout strength of 14,000 pounds per square foot.
   5) Free of cracks, cleavages, pinholes, or other defects.
   6) Joint sealer strip to be from the same material as the liner.
   7) If gasketed joints, comply with ASTM F 477 and ability to withstand a minimum groundwater pressure equal to that of the pipe liner or 20 psi, whichever is greater.

G. Ductile Iron Pipe (DIP) 8 inch to 54 inch:

1. General:
   a. Comply with AWWA C151.
   b. Minimum thickness Class 52.

2. Interior Linings:
   a. Provide interior lining for ductile iron pipe and fittings used for all gravity sewers and drop connections.
   b. Use linings specifically designed for sanitary sewer applications, such as ceramic epoxy. Other lining types may be allowed upon approval of the Engineer.
   c. Apply lining to interior of unlined ductile iron pipe and fittings according to the published specifications from the manufacturer.
   d. Seal all cut ends and repair field damaged areas according to the manufacturer's recommendations.

3. Exterior Coating: Asphalt.

4. Joints: Push-on complying with AWWA C111.

5. Fittings: Mechanical complying with AWWA C110 or AWWA C153.

6. Polyethylene Encasement:
   a. Comply with AWWA C105.
   b. Minimum thickness of 8 mils.
   c. Use for all ductile iron pipe and fittings in buried service.

H. Vitrified Clay Pipe (VCP) 8 inch to 42 inch:

1. Pipe and fittings complying with ASTM C 700.

2. Compression joints complying with ASTM C 425 for plain end pipe or bell and spigot pipe.

3. Test according to ASTM C 301.

I. Double Walled Polypropylene Pipe 12 inch to 30 inch:

1. Comply with ASTM F 2764.

2. Minimum pipe stiffness per ASTM D 2412, 46 psi.

3. Integral bell and spigot joint complying with ASTM D 3212 and ASTM F 477.

J. Triple Walled Polypropylene Pipe 30 inch to 36 inch:

1. Comply with ASTM F 2764.

2. Minimum pipe stiffness per ASTM D 2412, 46 psi.

3. Integral bell and spigot joint complying with ASTM D 3212 and ASTM F 477.

2.02 SANITARY SEWER FORCE MAINS

A. Ductile Iron Pipe (DIP) 4 inch to 54 inch: Comply with the DIP requirements in Section 33 31 13, 2.01. If joint restraints are specified, comply with Section 33 14 16, 2.03.

B. Polyvinyl Chloride Pipe (PVC): Comply with the requirements in Section 33 14 16, 2.01 for PVC pipe. Provide restrained joints when specified.

C. Sewage Air Release Valve:

1. **General:** Consists of an elongated tapered or conical body and a float to operate (open and close) under pressure without spillage. Provide valves suitable for pressures up to 150 psi. Use a float with a linkage connection to the seal plug assembly to prevent irregular air release and protect the connecting rod. Ensure the bottom of the valve body is sloped or funnel-shaped to encourage the accumulated sewage and solids to drain from the valve. Preserve a volume of air at all times between the liquid sewage and the seal plug assembly. Provide a flushing port with attachments for backwashing.

2. **Materials:**
   a. **Body and Cover:**
      1) Stainless Steel: ASTM A 351.
      2) Cast Iron: ASTM A 126, Grade B.
      3) Ductile Iron: ASTM A 536, Grade 65-45-12.
      4) Other corrosion resistant materials.
   b. **Internal Metal Components:** Stainless steel.
   c. **Float:** Stainless steel, ASTM A 240, Type 304 or Type 316, or foamed polypropylene.
   d. **Seal Plug Assembly:** Stainless steel, foamed polypropylene, EPDM rubber,

Nitrile (Buna-N) rubber, and reinforced nylon.

3. **Tapping Saddle:** Stainless steel or nylon.

4. **Pit:** Construct according to SUDAS Figure 4010.202.

D. Tracer Wire: Comply with Section 33 14 16, 2.05. Tracer wire will be required on all force mains.

E. Tracer Wire Station:

1. Two internal terminals with shunt.

2. Five to six foot plastic post (color as specified by the Jurisdiction).

3. Removable top cap with lock.

4. Decals indicating “Sewer Force Main” or similar language.

2.03 CASING PIPE

Comply with Section 31 23 34, 2.02 for casing pipe requirements.

2.04 SANITARY SEWER SERVICES

A. Connection to Main:

1. **PVC Main:**
   a. Preformed wye or tee service fitting with integral bell and spigot joints with elastomeric seals complying with ASTM D 3034 or ASTM F 949.
   b. Preformed saddle wye or saddle tee for service tap complying with ASTM D 3034 or ASTM F 949.
   c. PVC plastic meeting ASTM D 1784, Cell Classification 12454.

2. **PVC Composite Main:**
   a. Preformed wye or tee service fitting with integral bell and spigot joints with elastomeric seals complying with ASTM D 3212.
   b. Preformed saddle wye or saddle tee for service tap complying with ASTM D 2680.

3. **RCP Main:** Preformed saddle wye or saddle tee service tap designed for use with RCP.

4. **VCP Main:**
   a. Precast VCP wye or tee service fitting complying with ASTM C 700 for pipe and ASTM C 425 for compression joints.
   b. Preformed saddle wye or saddle tee service tap designed for use with VCP.

5. **DIP Main:**
   a. Use DIP wye or tee fittings complying with AWWA C110 or AWWA C153.
   b. Preformed saddle wye or tee services tap designed for use with DIP. Cut the hole for the tap with equipment designed for application.

B. Wye and Tee Pipe Stop: All saddle wye or saddle tee fittings must provide integrally molded pipe stop in the branch for positive protection against service pipe insertion beyond the inside of sewer main pipe wall.

C. Service Pipe: Use products as required by local plumbing code or regulations, if applicable.

Otherwise, use the following:

1. **PVC:**
   a. Comply with ASTM D 3034, minimum thickness SDR 23.5 minimum pipe stiffness of 153 psi as per ASTM D 2412.
   b. PVC plastic meeting ASTM D 1784, Cell Classification 12454.
   c. Integral bell and spigot type rubber gasket joint complying with ASTM D 3212.

2. **DIP:** As specified for sanitary sewer force main, including polyethylene encasement.

2.05 SANITARY SEWER SERVICE RELOCATIONS

A. Comply with Section 33 31 13, 2.04 for all materials used for sanitary service relocation.

B. Use the same nominal size as the existing service being relocated.

2.06 SANITARY SEWER CLEANOUT

Comply with SUDAS Figure 4010.203.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify measurements at site. Make necessary field measurements to accurately determine pipe makeup lengths or closures.

B. Examine site conditions to ensure construction operations do not pose hazards to adjacent structures or facilities.

3.02 GRAVITY SEWER INSTALLATION

A. General:

1. Install watertight plug to prevent water from entering the existing sewer system.

2. Clean pipe interior and joints prior to installation. Keep pipe clean during construction.

3. Begin at the lowest point in the line. Lay groove or bell end pointing upstream unless otherwise specified.

4. Assemble joints according to Section 33 31 13, 3.04.

5. Use a saw to cut ends of pipe flush with inside wall of manholes and structures. Do not use hammer or other means to break pipe.

6. Provide manholes as specified in the contract documents.

7. Install cap, plug, or bulkhead at exposed ends of pipe upon completion of construction or whenever pipe installation is not in progress.

B. Trenched:

1. Excavate trench and provide pipe bedding and backfill material as specified in Section 31 23 33.

2. Prepare trench bottom to design line and grade so that only minor movement of the pipe is necessary after installation.

3. Lay pipe to design line and grade. Set field grades to invert of pipes.

4. Provide uniform bearing for full pipe barrel length. Excavate bell holes as necessary for uniform support of pipe barrel on bedding material.

5. Do not lay pipe in water or on saturated soil or bedding, or allow water to rise in trench around pipe prior to placing backfill material.

6. Do not disturb installed pipe and bedding when using movable trench boxes and shields. Block or anchor pipe as necessary to prevent joint displacement.

7. Install wye or tee service fitting at each location specified in the contract documents.

C. Trenchless: Comply with Section 31 23 34.

3.03 SANITARY SEWER INSTALLED WITHIN A CASING PIPE

Comply with Section 31 23 34, 3.04 for installation of sanitary sewer within casing pipe.

3.04 GRAVITY MAIN PIPE JOINTING

A. General:

1. Clean joint surfaces to remove soil or foreign material prior to jointing pipe.

2. Assemble joints according to pipe manufacturer's recommendations. Use equipment that does not apply damaging forces to pipe joints.

B. Polyvinyl Chloride Pipe (PVC) and Polyvinyl Chloride Composite Pipe (truss-type):

1. Coat rubber gasket and joint with soap-based lubricant immediately prior to closing joint.

2. Seal ends of PVC composite and closed profile pipe at manholes with the coating recommended by the manufacturer.

C. Reinforced Concrete Pipe (RCP): Coat rubber gasket and joint with soap-based lubricant immediately prior to closing joint.

D. Ductile Iron Pipe (DIP):

1. Push-on Joint: Coat gasket and joint with soap-based lubricant immediately prior to closing joint.

2. Mechanical Joint: Wash plain end, bell socket, and gasket with soap solution. Press gasket into socket, set gland, and tighten bolts uniformly.

E. Polypropylene Pipe: Coat gasket and bell with lubricant immediately prior to closing joint.

F. Connections between Dissimilar Pipes:

1. Use manufactured adapters or couplings approved by the Engineer.

2. Where adapters or couplings are not available, the Engineer may authorize use of a Type PC-2 concrete collar as shown on SUDAS Figure 4020.211.

3.05 FORCE MAIN INSTALLATION

A. General: Install according to Section 33 14 16.

B. Tracer Wire:

1. Required for all force main installations. Comply with Section 33 14 16.

2. Install tracer wire station at each end of the force main and at additional locations specified in the contract documents.

3. Bury end of tracer wire station 2 feet and compact.

3.06 SANITARY SEWER SERVICE STUBS

A. Provide sanitary sewer service stubs at locations specified in the contract documents.

B. Install wye or tee for each service connection.

1. Connection of sanitary service to new sewer main, except RCP:
   a. Use only factory wye or tees.
   b. Install according to manufacturer's requirements and Section 33 31 13, 2.04 and 3.04 for joints.

2. Connection to existing sewer main and new RCP:
   a. Cut sewer main for service tap with hole saw or sewer tap drill.
   b. Use preformed saddle wye or saddle tee for service tap. Use a gasketed saddle with rigid pipe mains and a solvent-cemented saddle with PVC mains.
   c. Install according to the manufacturer's requirements, but always attach with at least two stainless steel band clamps.

C. Install service stub from sewer main to a location 10 feet beyond the right-of-way line or as specified in the contract documents. Comply with SUDAS Figure 4010.201.

1. Install according to Section 33 31 13, 3.02.

2. Install service stub with a slope between 2% and 5% for 4 inch pipes, and between 1% and 5% for pipes 6 inches and greater.

3. Terminate end of service stub 10 to 12 feet below finished ground elevation or as specified in the contract documents.

4. If the depth of the sewer main causes the service to exceed a depth of 12 feet or a slope of 5%, install a service riser.

5. For undeveloped properties, place watertight stopper, cap, or plug in end of sanitary sewer service. Mark the end of the service line as required by the Jurisdiction or as specified in the contract documents.

6. For reconnection of new service pipe with existing service pipe, comply with the Jurisdiction's plumbing code.

3.07 SANITARY SEWER SERVICE RELOCATION

A. Relocate existing sanitary sewer services that conflict with new storm or sanitary sewer installations. Existing services located within a conflict zone from 6 inches below the bottom of the proposed sewer pipe to 2 inches above the top of the proposed sewer pipe require relocation.

B. When a conflicting service is encountered:

1. Determine grades and elevations of the existing service and proposed main.

2. Determine the extent of service replacement necessary to relocate the service outside of the conflict zone while maintaining a minimum 1% slope on the sewer service.

3. If it is not feasible to maintain a minimum slope of 1% on the relocated service, a special design and additional work may be required. Stop work and contact the Engineer. Do not remove sewer service unless directed by the Engineer.

4. If service relocation with a minimum slope of 1% is feasible, proceed with removal and replacement of the existing sanitary sewer service.
   a. Length of replacement varies. Remove the existing service to the extent necessary to move the service out of the conflict zone.
   b. Use all new materials complying with Section 33 31 13, 2.04.
   c. Re-install the service according to Section 33 31 13, 3.02.
   d. Maintain a minimum 1% grade on relocated service.

3.08 SANITARY SEWER ABANDONMENT

A. Plug:

5. Prior to placing the sewer plug, the Engineer will verify the sewer line is not in use.

6. Construct sewer plug by completely filling the end of the pipe with concrete. Force concrete into the end of the pipe for a distance of 16 inches, or one-half the pipe diameter, whichever is greater.

B. Fill:

7. Prior to filling the sewer, the Engineer will verify the sewer line is not in use.

8. If specified in the contract documents, fill the line to be abandoned with flowable mortar, foamed cellular concrete, or CLSM (comply with Section 31 23 33) by gravity flow or pumping.

9. Batching, mixing, and placing may be started when temperature is 34°F and rising. Cease mixing and placing when temperature is 38°F or less and falling.

3.09 CONNECTION TO EXISTING MANHOLE

Comply with Section 33 42 31, 3.05.

3.10 SANITARY SEWER CLEANOUT

Provide cleanouts where specified in the contract documents. Comply with SUDAS Figure 4010.203.

3.11 TOLERANCES

Apply the following tolerances to utilities installed by open trench construction. For trenchless construction, comply with Section 31 23 34.

A. Gravity Main:

1. Do not allow horizontal and vertical alignment to vary from design line and grade at any structure by more than 1% of the inside diameter of the pipe or 1/4 inch, whichever is larger.

2. Do not allow the horizontal alignment of the pipe to vary from design line at any point along the pipe by more than 1% of the inside diameter of the pipe.

3. Low spots holding water exceeding the following depths for each pipe size will be considered unacceptable and must be removed and reinstalled to proper grade.

Pipe Diameter	Maximum Low Spot Depth
8”	1/2”
10”	1/2”
12”	3/4”
15”	3/4”
18” and Larger	5% of Pipe Diameter*

* Measured to the nearest 1/2”

B. Force Main: Do not allow horizontal and vertical alignment of trenched force mains to vary from design line and grade by more than 3 inches.

3.12 CONFLICTS

C. Horizontal Separation of Gravity Sanitary and Combined Sewers from Water Mains: Separate gravity sanitary and combined sewer mains from water mains by a horizontal distance of at least 10 feet unless:

1. The top of a sewer main is at least 18 inches below the bottom of the water main, and

2. The sewer is placed in a separate trench or in the same trench on a bench of undisturbed earth at a minimum horizontal separation of 3 feet from the water main.

3. When it is impossible to obtain the required horizontal clearance of 3 feet and a vertical clearance of 18 inches between sewers and water mains, provide a linear separation of at least 2 feet and one of the following:
   a. Construct sanitary and combined sewers of water main materials meeting the requirements of Section 33 14 16, 2.01.
   b. Enclose the water main in a watertight casing pipe with an evenly spaced annular gap and watertight end seals.

D. Horizontal Separation of Water Mains from Sanitary and Combined Sewer Manholes: Ensure water pipes do not pass through or come in contact with any part of a sanitary or combined sewer manhole. Maintain a minimum horizontal separation of 3 feet.

E. Separation of Sanitary Sewer Force Mains from Water Mains: Separate sanitary sewer force mains and water mains by a horizontal distance of at least 10 feet unless:

1. The force main is constructed of water main materials meeting a minimum pressure rating of 150 psi and the requirements of Section 33 14 16, 2.01 and

2. The sewer force main is laid at least 4 linear feet from the water main.

F. Separation of Sanitary and Combined Sewers and Water Main Crossovers:

1. Vertically separate sanitary sewers crossing under any water main by at least 18 inches when measured from the top of the sewer to the bottom of the water main. If physical conditions prohibit the separation, do not place the sewer closer than 6 inches below a water main or 18 inches above a water main. Maintain the maximum feasible separation distance in all cases.

2. Where the sanitary sewer crosses over or is less than 18 inches below a water main, utilize one of the following within 10 feet measured edge-to-edge horizontally, centered on the crossing:
   a. Construct sewer pipe of water main material.
   b. Enclose the water main in a watertight casing pipe with an evenly spaced annular gap and watertight end seals.

3.13 CLEANING, INSPECTION, AND TESTING

Clean, inspect, and test sanitary sewer per Section 33 01 12.

END OF SECTION

SECTION 33 31 14

CLEANING, INSPECTION, AND TESTING OF SEWERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cleaning, Inspecting, and Testing Sanitary Sewers

B. Cleaning, Inspecting, and Testing Storm Sewers

C. Cleaning and Inspecting Pipe Culverts

D. Cleaning and Inspecting Rehabilitated Pipes

1.02 DESCRIPTION OF WORK

A. Clean, inspect, and test sanitary sewer gravity mains, sanitary sewer force mains, and sanitary sewer service stubs.

B. Clean, inspect, and test storm sewers.

C. Clean and inspect pipe culverts.

D. Clean, inspect, and test rehabilitated pipe.

1.03 SUBMITTALS

Comply with General Provisions.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING

Comply with General Provisions, as well as the following:

A. Notify Engineer at least 24 hours prior to performing testing.

B. The Engineer must be present to review testing procedures and to record results.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 TESTING EQUIPMENT

A. General: Comply with applicable sections of ASTM and other applicable industry standards and codes.

B. Video Inspection:

1. Camera:
   a. High-resolution color with adjustable iris focus.
   b. Pan and tilt capabilities.
   c. Integral lighting suitable to provide proper illumination and a clear video image of the entire periphery of the pipe.
   d. Capable of operating in 100% humidity conditions.
   e. Produce a high quality video image.

2. Provide closed-circuit video inspection equipment capable of displaying on-screen footage of distance measured to within 1% of actual distance.

3. Record the inspection in color in the recording media specified by the Engineer. Forward the recording to the Engineer.

PART 3 - EXECUTION

3.01 CLEANING

A. Clean all sanitary sewers, storm sewers, and pipe culverts prior to testing by flushing with high pressure water and removing debris by vacuum extraction, and by removing sheeting, bracing, shoring, forms, soil sediment, concrete, or other debris.

B. Do not discharge soil sediment or debris to drainage channels, existing storm sewers, or existing sanitary sewers.

3.02 VIDEO INSPECTION

A. General:

1. Unless otherwise specified in the contract documents, conduct video inspection of all new and rehabilitated sanitary and storm sewers after all backfill and compaction operations are completed, but prior to paving.

2. Notify the Engineer the day prior to inspection so the Engineer may be present during the inspection.

3. Notify the Engineer of the extent of noncompliance with the low spot depth tolerances in Section 33 31 13 for sanitary sewers and Section 33 42 11 for storm sewers.

4. Re-inspect sewers after any corrective action has been completed.

B. Inspection Procedure:

1. Prior to video inspection, run sufficient water through the pipe to saturate potential low spots so they may be detected during inspection.

2. Inspect each pipe segment between manholes or access points in a single, continuous run. Progress through the entire project in a uniform direction.

3. Inspect all lateral connections and other observations at right angles utilizing the pan and tilt capabilities of the camera.

4. Center the video camera in the pipe during the inspection.

5. Do not exceed 30 feet of inspection per minute.

C. Inspection Reporting:

1. Provide a copy of the video inspection including on-screen continuous footage, pipe diameter, direction of viewing, and manhole and street location references in the recording. Affix labels to the recording media to include the name of the project, the date, and the location of the inspection.

2. Provide a written report of the inspection. In the report, include true-to-scale drawings of all sewer defects and observation locations. Reference the time stamp on each line item entry on the written report.

3.03 SANITARY SEWER LEAKAGE TESTING

Perform one or more of the following tests on new sanitary sewer gravity mains and sanitary sewer service stubs. Conduct tests only if service lines to any private properties are plugged and not active. Test sanitary sewer manholes separately as specified in Section 33 42 32.

A. Sanitary Sewer Infiltration Testing:

1. Use only where ground water is more than 2 feet above top of pipe at highest point in section being tested.

2. Provide documented verification of ground water elevations for no less than 24 hours before measurement of infiltration.

3. Measure infiltration in sanitary sewer with a V-notch weir in a downstream manhole.

4. The maximum allowable infiltration for new sanitary sewers, including manholes, is 200 gallons per inch of diameter per mile of pipe per day.

B. Sanitary Sewer Exfiltration Testing:

1. **General:** Use an exfiltration test when ground water level is less than 2 feet above top of pipe at highest point in section being tested. Sectionalize the test section so the internal pressure in the pipe does not exceed 5 feet of water.

2. **Test Procedures:**
   a. Install a watertight plug in the inlet of the upstream and downstream manhole of sewer section being tested.
   b. Fill the sewer and upstream manhole with potable water until the water elevation in the upstream manhole is 2 feet higher than outside top of pipe in section being tested or 2 feet above existing ground water level, whichever is highest elevation.
   c. Allow the water level to stabilize for 30 minutes, then refill the upstream manhole with water to the original level and begin the test.
   d. Measure the amount of water lost in the upstream manhole in 1 hour. Use that amount to determine exfiltration in a 24 hour period.

3. **Exfiltration Rate:** The following table may be used to determine exfiltration in gallons per 24 hours by measuring the loss that occurs in 1 hour. The table is

applicable only for 48 inch diameter manholes.

The maximum allowable exfiltration for new sanitary sewer, including manholes, is 200 gallons per inch of diameter per mile of pipe per day.

Table 4060.01: Loss in Gallons per 24 Hours for Drop in Water Level per Hour in 48 Inch Diameter Manhole (table may be interpolated to the nearest 1/4" drop)

Drop	0"	1"	2"	3"	4"	5"	6"	7"	8"	9"
	0	188	376	564	752	940	1128	1316	1504	1692

For manholes larger than 48 inch diameter use the following

formula: $G = 0.0816(H)(D^2)$

Where:
G = loss in gallons.
D = diameter of manhole in inches.
H = water level drop in manhole in inches.

C. Sanitary Sewer Low Pressure Air Testing:

1. **General:**
   a. A low pressure air test may be used in lieu of an exfiltration test except as noted.
   b. Air test is not recommended when ground water elevation is 2 feet or greater above the top of the pipe, and cannot be used when ground water is greater than 6 feet above the top of the pipe.
   c. Use extreme care and follow safety precautions during testing operations. No one is allowed in manholes during testing.

2. **Test Procedures:**
   a. Clean entire line of all debris. Flush or wet line to produce consistent results.
   b. Plug all inlets and outlets to resist the test pressure. Special attention must be given to stoppers and laterals.
   c. Determine the test duration for the section being tested from the following table. This table ignores pipe length and uses the factor 0.472 x d, with “d” being in inches. Pressure holding time is based on average holding pressure of 3.0 psi or drop from
   3.5 psi to 2.5 psi.

Table 4060.02: Test Duration

Size Pipe (inches)	Test Period Duration (minutes)
8	4.0
10	5.0
12	6.0
15	7.0
18	8.5
21	10.0
24	11.5
27	13.0
30	14.0
36	17.0

42	20.0
48	23.0
54	25.5
60	28.5

d. Add air to the line segment being tested until the internal air pressure of the sewer line is raised to approximately 4.0 psi greater than the average back pressure of any ground water that may be over the top of the pipe. Pressure in the sewer should not exceed 5.0 psi. Allow at least 2 minutes for air pressure to stabilize.
e. When pressure has stabilized and is at or above the starting test pressure of 3.5 psi, commence the test. Record the drop in pressure for the test period. The test may be discontinued when the prescribed test time has been completed, even though 1.0 psi drop has not occurred.
f. If the ground water level at the time of testing is above the pipe invert, add 0.43 psi of air per foot of water above the invert to the test air pressure range of 2.5 psi to 3.5 psi stated above.
g. If the pressure drop exceeds 1.0 psi during the test period, the test will be considered to have failed. Repair and retest the line.

D. Sanitary Sewer Vacuum Testing: Comply with ASTM C 1244.

1. **General:**
   a. Vacuum testing may be used in lieu of other specified test methods.
   b. Use extreme care and follow safety precautions during testing operations. Keep personnel out of and away from manholes during testing.
   c. Where practical, clean the pipe prior to testing and wet the pipe surface. Isolate the test segment as necessary, including closing service connections.

2. **Test Procedures:**
   a. Determine the test time for the size of pipe being tested using the following table.

Table 4060.03: Minimum Test Time

Nominal Pipe Size (inches)	Time (Minutes/100 feet of pipe)
4	0.3
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6
27	4.2
30	4.8
33	5.4
36	6.0

   b. Test time is the time required for vacuum to drop from 3.5 to 2.5 psi.
   c. Use a vacuum pump with the capacity to evacuate the sewer test section in time equal or less than that shown in Table 4060.03 for the size of pipe being tested.
   d. Evacuate air until the internal air pressure of the sewer line is lowered by approximately 4.0 psi. Allow the air pressure to stabilize.

e. When the air pressure is stabilized near the starting test vacuum of 3.5 psi, commence the test by allowing gage pressure to drop to 3.5 psi, then commence time recording. Record the drop in vacuum for the test period.
f. If the drop in vacuum is 1.0 psi or less during the test period, the test will be considered successfully passed.
g. If the drop in vacuum is greater than 1.0 psi during the test period, inspect, evaluate, repair, and retest.

3.04 DEFLECTION TESTING

A. Perform deflection tests on all flexible sanitary sewer mains, excluding ductile iron pipe. Also perform deflection tests on all flexible storm sewer or culvert pipe 12 inches in diameter or greater.

B. Perform deflection tests after backfill has been in place at least 30 calendar days and before paving activity takes place, or as per appropriate sections of these specifications.

C. Pull 9 arm deflection mandrel, complying with applicable ASTM Standards, through sewer by hand.

D. Ensure pipe deflection does not exceed 5% of average inside diameter as established by ASTM Standards.

E. Remove and replace pipe exceeding deflection limits.

F. Handle and divert existing flows during deflection testing.

3.04 FORCE MAIN TESTING

A. Provide test pumps, test plugs, pipe, and gages. Make necessary piping connections.

B. Fill the force main with potable water and flush before testing to remove entrapped air. Other water sources may be used if approved by the Engineer.

C. Insert taps as required to remove air. Plug taps after the completion of tests.

D. Use a test pressure of 1.5 times the working pressure at the lowest point along the test section, but not less than 50 psi.

E. Pressurize the test section and allow it to stabilize prior to beginning the leakage test.

F. Maintain pressure to within 5 psi of the test pressure by pumping in potable water as required.

G. Leakage is the quantity of water that must be supplied into the test section to maintain pressure within 5 psi of the specified test pressure during a 2 hour test period.

H. The maximum allowable leakage is determined by the following

formula: $L = \frac{(S)(D)(P)^{0.5}}{148{,}000}$

Where:
L = allowable leakage, in gallons per hour S = length of pipe tested, in feet
D = nominal pipe diameter, in inches

P = average test pressure, in pounds per square inch

The following table assumes an average test pressure (P) of 50 psi and length of pipe (S) of 1,000 feet.

Table 4060.04: Maximum Allowable Leakage Rate

Pipe Diameter (inches)	Allowable Leakage Rate (gallons/hour/1,000 feet of pipe)
4	0.19
6	0.29
8	0.38
10	0.48
12	0.57
14	0.67
16	0.76

I. Examine exposed pipe and fittings during testing. Repair all visible leaks.

J. If the test indicates leakage greater than allowed, locate, repair, or replace damaged or defective pipe, and repeat tests until the requirements are met.

END OF SECTION

SECTION 33 41 00

SUBDRAINS AND FOOTING DRAIN COLLECTORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Subdrains

B. Subdrain Cleanouts and Outlets

C. Footing Drain Collectors

D. Storm Sewer Service and Connections

1.02 DESCRIPTION OF WORK

A. Construct subdrains, subdrain cleanouts and outlets, and footing drain collectors.

B. Construct storm sewer service and connections.

1.03 SUBMITTALS

Comply with General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 FOOTING DRAIN COLLECTORS

A. Polyvinyl Chloride Pipe and Fittings (Solid Wall PVC):

1. Comply with ASTM D 3034, minimum thickness SDR 35, 46 psi minimum pipe stiffness.

2. Use PVC plastic conforming to ASTM D 1784, Cell Classification 12454.

3. Integral bell and spigot type rubber gasket joint complying with ASTM D 3212 and

ASTM F 477.

B. Corrugated Polyvinyl Chloride Pipe and Fittings (Corrugated PVC):

1. Use corrugated exterior, smooth interior, PVC.

2. Comply with ASTM F 949, minimum pipe stiffness, 46 psi.

3. Use PVC plastic complying with ASTM D 1784, Cell Classification 12454.

4. Integral bell and spigot type rubber gasket joint complying with ASTM D 3212 and ASTM F 477.

C. High Density Polyethylene Pipe and Fittings (HDPE):

1. AASHTO M 252 or M 294, Type S corrugated exterior and smooth interior.

2. Integral bell and spigot joints with O-ring rubber gasket meeting ASTM F 477.

D. Reinforced Concrete Pipe (RCP): Comply with Section 33 42 11, 2.01.

2.02 TYPE 1 SUBDRAINS (LONGITUDINAL SUBDRAIN)

A. Polyvinyl Chloride Pipe and Fittings (Solid Wall PVC):

1. Comply with Section 33 41 00, 2.01, A.

2. Slot subdrain pipe according to ASTM F 949 or perforate with four rows of 1/4 inch to 3/8 inch diameter holes along the bottom of the pipe.

B. Corrugated Polyvinyl Chloride Pipe and Fittings (Corrugated PVC):

1. Comply with Section 33 41 00, 2.01, B.

2. Slot subdrain pipe according to ASTM F 949.

C. High Density Polyethylene Pipe and Fittings (HDPE):

1. Comply with Section 33 41 00, 2.01, C.

2. Slot or perforate according to AASHTO M 252, Type SP.

D. Corrugated Polyethylene Tubing and Fittings (Corrugated PE):

1. Comply with AASHTO M 252, Type C, corrugated interior and exterior.

2. Use only fittings supplied or recommended by pipe manufacturer for soil tight service.

3. Slot or perforate according to AASHTO M 252, Type CP.

2.03 TYPE 2 SUBDRAINS (COMBINATION SUBDRAIN/FOOTING DRAIN COLLECTOR)

A. Use materials complying with Section 33 41 00, 2.01.

B. Perforate all pipe per the following requirements:

1. Solid Wall PVC Pipe: Comply with ASTM F 949 or perforate with four rows of 1/4 inch to 3/8 inch diameter holes along the bottom of the pipe.

2. Corrugated PVC Pipe: Comply with ASTM F 949.

3. HDPE Pipe: Comply with AASHTO M 252 or M 294, Type CP or Type SP.

2.04 POROUS BACKFILL MATERIAL

A. Crushed Stone or Processed Gravel: Comply with Iowa DOT Article 4109.02, Gradation No. 29 in the Aggregate Gradation Table and the quality requirements of Iowa DOT Section 4131.

B. Pea Gravel: Comply with Iowa DOT Article 4109.02, Gradation No. 20 or No. 21 in the Aggregate Gradation Table and the quality requirements of Iowa DOT Section 4131.

2.05 SUBDRAIN OUTLETS

A. Corrugated Metal Pipe (CMP):

1. Comply with AASHTO M 36, Type 1.

2. Zinc coating complying with AASHTO M 218.

3. Use a corrugated steel circular section with annular or helical corrugation.

4. Minimum thickness of 0.052 inch.

B. Corrugated HDPE:

1. Comply with Section 33 41 00, 2.01.

2. Pipe to be double-walled.

C. PVC: Comply with Section 33 41 00, 2.01.

D. Coupling Bands: Match annular or helical corrugations on coupling bands to pipe ends.

E. Rodent Guard: Mild steel meeting ASTM A 36 with hot-dip galvanized coating applied following welding and fabrication. Comply with Iowa DOT Materials I.M. 443.01 and SUDAS Figure 4040.233. Required for 4 inch or 6 inch subdrains.

2.06 SUBDRAIN OR FOOTING DRAIN CLEANOUTS

A. Type A-1 or A-2 Cleanouts:

1. Use solid wall PVC riser pipe and fittings of the same diameter (maximum 8 inch) as the adjacent subdrain or footing drain pipe. Comply with SUDAS Figure 4040.232.

2. Use a light duty (HS-20 loading) cast iron casting for Type A-1 cleanouts. When a PVC cap is used on top of the cleanout, drive a 1 foot length of reinforcing steel into the ground immediately adjacent to the cleanout to allow future location.

B. **Type B Cleanouts:** Comply with SUDAS Figure 4040.232. Use 24 inch diameter riser for subdrain 8 inches or smaller. Use 30 inch diameter riser for 10 inch and 12 inch subdrains.

1. **Reinforced Concrete:** Use Class III RCP complying with Section 33 42 11 2.01.

2. **Polyvinyl Chloride:**
   a. Comply with ASTM D 1784, Cell Classification 12454 for PVC plastic.
   b. Conform to ASTM D 3212 for joints.
   c. Comply with ASTM F 477 for flexible elastomeric.

3. **Concrete:** Comply with Section 33 42 31 for structural concrete for base and invert shaping.

4. **Castings:** Use a light duty (HS-20 loading) cast iron casting complying with Section 33 42 31, 2.10 or a ductile iron casting meeting ASTM A 536.

2.07 ENGINEERING FABRIC

Use fabric complying with Iowa DOT Article 4196.01.

2.08 STORM SEWER SERVICE STUBS

Use materials complying with Section 33 41 00, 2.01.

PART 3 - EXECUTION

3.01 SUBDRAINS

A. Install Type 1 or Type 2 subdrain where specified in the contract documents. Comply with SUDAS Figure 4040.231.

1. Excavate trench and provide pipe bedding and backfill as shown on the figures. Install engineering fabric if specified in the contract documents.

2. Begin subdrain installation at the outlet and continue upgrade.

3. Lay subdrain pipe to the proper line and grade. Place pipe with the perforations down.

4. If concrete pipe is specified for Type 2 subdrains, wrap exterior of each joint with engineering fabric and do not use joint sealant.

5. Place porous backfill material over installed pipe in layers no more than 6 inches thick. Thoroughly tamp each layer with mechanical tampers.

6. Restore pavement subbase material, shoulder material, or ground above subdrain trench as applicable.

B. Provide cleanouts where specified in the contract documents. Comply with SUDAS Figure 4040.232.

C. Provide outlets where specified in the contract documents.

1. Comply with SUDAS Figure 4040.233 for outlets to structures.

2. Install a rodent guard on all subdrain outlet pipes 6 inches and smaller.

3.02 FOOTING DRAIN COLLECTORS

A. Install footing drain collectors according to Section 31 23 33.

B. If specified, install engineering fabric.

C. Provide cleanouts and connections where specified in the contract documents.

1. Connect footing drain sewer collectors to storm sewer manhole or intake.

2. Provide fabricated or preformed wye or tee service fitting for each platted lot or building.

D. Provide manholes, where specified, according to Section 33 42 31.

3.03 FOOTING DRAIN SERVICE STUBS

A. Provide footing drain service stubs at locations specified in the contract documents.

B. Install wye or tee for each service connection.

1. For new storm sewer and footing drain collector construction, except RCP sewers, install wye or tee fittings according to the manufacturer's requirements.

2. For existing storm sewers, existing footing drain collectors, and all RCP sewers, saw or drill a neat hole in main and install preformed saddle wyes or tees according to the manufacturer's requirements.

C. Install footing drain service stub to a location 10 feet beyond the right-of-way line or as specified in the contract documents.

1. For undeveloped properties, place a watertight stopper or plug in the end of the storm sewer service.

2. For reconnection of existing service pipe to new sewer service pipe, use a manufactured flexible connection.

END OF SECTION

SECTION 33 42 11

STORM UTILITY PIPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Storm Sewers

B. Abandonment of Storm Sewers

1.02 DESCRIPTION OF WORK

A. Construct storm sewers.

B. Abandon storm sewers.

1.03 SUBMITTALS

Comply with General Provisions.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

None.

PART 2 - PRODUCTS

2.01 STORM SEWERS

A. Reinforced Concrete Pipe (RCP):

1. Comply with ASTM C 76.
2. Minimum Class III, Wall B (Iowa DOT Class 2000D).
3. Use tongue and groove joints wrapped with engineering fabric, unless a rubber O-ring or profile gasket complying with ASTM C 443 is specified.

B. Reinforced Concrete Arch Pipe (RCAP):

1. Comply with ASTM C 506.

2. Minimum Class A-III (Iowa DOT Class 2000D).

3. Use tongue and groove joints wrapped with engineering fabric, unless a rubber O-ring or profile gasket complying with ASTM C 443 is specified.

C. Reinforced Concrete Elliptical Pipe (RCEP):

1. Comply with ASTM C 507.

2. Minimum Class HE III (Iowa DOT Class 2000D) or Class VE III (Iowa DOT Class 2000D).

3. Use tongue and groove joints wrapped with engineering fabric, unless a rubber O-ring or profile gasket complying with ASTM C 443 is specified.

D. Reinforced Concrete Low Head Pressure Pipe (RCPP):

1. Comply with ASTM C 361; minimum Class C 25.

2. Use tongue and groove joints. Comply with ASTM C 361 for rubber O-rings or profile gaskets.

E. Polyvinyl Chloride Pipe (PVC):

1. Use pipe complying with the following:
   a. Types of PVC pipes:
      1) Corrugated exterior, smooth interior, ASTM F 949.
      2) Solid wall, ASTM D 3034 or ASTM F 679.
      3) Closed profile, ASTM F 1803.
      4) Composite, ASTM D 2680.
   b. PVC plastic meeting ASTM D 1784, Cell Classification 12454.
   c. Minimum pipe stiffness of 46 psi.
   d. Integral bell and spigot joints with elastomeric seals according to ASTM D 3212 and ASTM F 477.

2. Use of this pipe material requires specific approval by the Engineer.

F. High Density Polyethylene Pipe (HDPE):

1. Use pipe complying with the following:
   a. AASHTO M 294, Type S corrugated exterior and smooth interior.
   b. Minimum pipe stiffness at 5% deflection according to ASTM D 2412.
   c. Integral bell and spigot joints with elastomeric seals complying with ASTM F 477.
   d. Maximum 5% deflection of the average inside diameter by testing after installation according to Section 33 31 14, 3.05.

2. Use of this pipe material requires specific approval by the Engineer.

G. Corrugated Metal Pipe (CMP):

1. Use pipe complying with the following:
   a. AASHTO M 36, Type I.
   b. Zinc coating complying with AASHTO M 218.
   c. Corrugated steel circular section with annular or helical corrugations.
   d. Gage of pipe according to Iowa DOT Standard Road Plan DR-104 or as

specified in the contract documents.
   e. Coupling bands with annular or helical corrugations to match pipe ends.

2. Use of this pipe material requires specific approval by the Engineer.

H. Spiral Rib Pipe:

1. Use pipe complying with the following:
   a. ASTM A 760 Type 1R.
   b. Corrugation profile of 3/4 inch by 3/4 inch by 7 1/2 inches.
   c. Type 2 aluminized steel complying with ASTM A 929.
   d. Minimum thickness of 0.064 inch. Use gage of pipe according to manufacturer's requirements.
   e. Coupling bands complying with manufacturer's recommendations.

2. Use of this pipe material requires specific approval by the Engineer.

I. Coated Corrugated Metal Pipe:

1. Use in corrosive soil or effluent conditions, or where specified in the contract documents or required by the Engineer.

2. Comply with AASHTO M 274. Use gage of pipe according to Iowa DOT Standard Road Plan DR-104 or as specified in the contract documents.

3. Use of this pipe material requires specific approval by the Engineer.

J. Corrugated Metal Arch Pipe (CMAP):

1. Use pipe complying with the following:
   a. AASHTO M 36, Type II.
   b. Zinc coating complying with AASHTO M 218.
   c. Corrugated steel Type I pipe reformed into a pipe-arch having an approximately flat bottom.
   d. Coupling bands with annular corrugations or helical corrugations to match pipe ends.
   e. Gage of pipe according to Iowa DOT Standard Road Plan DR-104.

2. Use of this pipe material requires specific approval by the Engineer.

K. Spiral Rib Arch Pipe:

1. Use pipe complying with the following:
   a. ASTM A 760 Type IIR.
   b. Corrugation profile of 3/4 inch by 3/4 inch by 7 1/2 inch.
   c. Type 2 aluminized steel complying with ASTM A 929.
   d. Minimum thickness of 0.064 inch. Use gage of pipe complying with manufacturer's requirements.
   e. Coupling bands complying with the manufacturer's recommendations.

2. Use of this pipe material requires specific approval by the Engineer.

L. Polypropylene Pipe:

1. Comply with the following for 12 inch to 30 inch pipe:
   a. Double walled pipe meeting ASTM F 2764.
   b. Minimum pipe stiffness per ASTM D 2412, 46 psi.
   c. Integral bell and spigot joint complying with ASTM D 3212 and ASTM F 477.

2. Comply with the following for 30 inch to 60 inch pipe:
   a. Triple walled pipe meeting ASTM F 2764.
   b. Minimum pipe stiffness per ASTM D 2412, 46 psi.
   c. Integral bell and spigot joint complying with ASTM D 3212 and ASTM F 477.

3. Use of this pipe material requires specific approval by the Engineer.

M. Bituminous Joint Primer: Material intended for use in priming concrete joints. Comply with the requirements of ASTM D 41.

N. Engineering Fabric: Comply with Iowa DOT Article 4196.01.

O. Non-Shrink Grout: Comply with Iowa DOT Materials I.M. 491.13.

2.02 LINEAR TRENCH DRAIN

Comply with approved manufacturer's requirements and Iowa DOT Materials I.M. 449 (MAPLE), as well as complying with SUDAS Figure 6010.521. Provide certification indicating continuous trench drain meets AASHTO M 306 for 40,000 pound proof load.

2.03 CASING PIPE

Comply with Section 31 23 34, 2.02 for casing pipe requirements.

2.04 PIPE APRONS

Comply with the requirements of Section 33 42 11, 2.01 for the pipe material of which the apron is constructed. Supply concrete pipe aprons according to SUDAS Figure 4030.222 and SUDAS Figure 4030.223. Supply CMP pipe aprons according to SUDAS Figure 4030.225.

2.05 APRON FOOTINGS

Comply with the requirements of Section 33 42 31 for reinforcing steel and structural concrete used in apron footings.

2.06 APRON GUARD

Use smooth or deformed steel bars, ASTM A 615, Grade 40 or Grade 60, or merchant quality, in the construction of the apron guard. Hot dip galvanize the apron guard according to ASTM A 123.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify measurements at site; make necessary field measurements to accurately determine pipe makeup lengths or closures.

B. Examine site conditions to ensure construction operations do not pose hazards to adjacent structures or facilities.

3.02 PIPE INSTALLATION

A. General:

1. Clean pipe interior and joints prior to lowering into trench. Keep pipe clean during construction.

2. Begin at the lowest point in the line. Lay groove or bell end pointing upstream unless otherwise specified.

3. Place pipe with lifting holes at the top of the pipe and fill lift hole with non-shrink grout or manufactured plugs.

4. Assemble joints as specified by the pipe manufacturer.

5. Use a saw to cut ends of pipe flush with inside wall of manholes, intakes, and structures. Do not use hammer or other means to break pipe.

6. Provide manholes and intakes as specified in the contract documents.

7. Use watertight stopper, plug, or other approved means to protect the exposed upstream ends of the pipe and prevent soil sediment from entering the storm sewer system.

B. Trenched:

1. Excavate trench and provide pipe bedding and backfill material as specified in Section 31 23 33.

2. Prepare trench bottom to design line and grade so that only minor movement of the pipe is necessary after installation.

3. Lay pipe to design line and grade. Set field grades to invert of pipe.

4. Provide uniform bearing for full pipe barrel length. Excavate bell holes as necessary for uniform support of pipe barrel on bedding material.

5. Do not lay pipe in water or on saturated soil or bedding, or allow water to rise in trench around pipe prior to placing backfill material.

6. Do not disturb installed pipe and bedding when using movable trench boxes and shields. Block or anchor pipe as necessary to prevent joint displacement.

C. Trenchless: Comply with Section 31 23 34.

3.03 STORM SEWER INSTALLED WITHIN A CASING PIPE

Comply with Section 31 23 34, 3.04 for installation of storm sewer within casing pipe.

3.04 LINEAR TRENCH DRAIN

A. Install according to the manufacturer's requirements and the contract documents.

B. Use duct tape or wood block to prevent intrusion of concrete during installation and paving.

C. Connect to existing intake or manhole according to Section 33 42 31 or discharge to an open drainageway/ditch.

3.05 PIPE JOINTING

A. General:

1. Clean joint surfaces to remove soil or foreign material prior to jointing pipe.

2. Assemble joints according to pipe manufacturer's recommendations. Use equipment that does not apply damaging forces to pipe joints.

B. Reinforced Concrete Pipe (RCP), Reinforced Concrete Arch Pipe (RCAP), and Reinforced Concrete Elliptical Pipe (RCEP):

1. Comply with SUDAS Figure 4020.211 for pipe joint wrapping. Secure engineering fabric in place to prevent displacement while placing backfill material.

2. If a rubber O-ring or profile gasket is specified for RCP, coat the rubber gasket and joint with soap-based lubricant immediately prior to closing the joint.

3. Place pipe such that joint openings on the outside or inside of the pipe do not exceed 1/8 inch at the bottom and 5/8 inch at the top.

C. Reinforced Concrete Low Head Pressure Pipe (RCPP); Polyvinyl Chloride Pipe (PVC) and Corrugated PVC Pipe; Polypropylene Pipe; and High Density Polyethylene Pipe (HDPE): Coat gasket and joint with soap-based lubricant immediately prior to closing the joint.

D. Corrugated Metal Pipe (CMP) and Corrugated Metal Arch Pipe (CMAP): Lap coupling bands to form a tightly closed joint upon installation.

E. Connections between Dissimilar Pipes:

1. Use manufactured adapters or couplings approved by the Engineer.

2. Where adapters or couplings are not available, the Engineer may authorize use of a concrete collar as shown in SUDAS Figure 4020.211.

3.06 APRONS

A. Install pipe aprons where specified in the contract documents. Use the same installation methods as used on the pipe to which the apron is being attached. Dewater area as necessary to prevent installing the apron in water or on saturated soil or bedding. Do not allow water to rise around the apron prior to backfilling the area.

B. Install apron footings where specified in the contract documents. Construct according to Section 33 42 31 and the contract documents. Dewater area as necessary to prevent installing the apron footing in water or on saturated soil or bedding. Do not allow water to rise around the apron footing prior to backfilling the area.

C. Anchor the last three concrete pipe sections and the apron together with two pipe connections per joint. Comply with Iowa DOT Standard Road Plan DR-121.

D. Attach corrugated metal aprons to the pipe with a manufacturer's approved bolt, weld, or clamp to fasten directly to the pipe.

E. Install apron guard where specified in the contract documents. Construct according to SUDAS Figure 4030.224 or 4030.225. Repair any damage to the galvanized coating that occurs due to storage, handling, or installation.

3.07 TOLERANCES

The following tolerances apply to utilities installed by open trench construction. For trenchless construction, comply with Section 31 23 34.

A. Do not allow horizontal and vertical alignment to vary from design line and grade at any structure by more than 1% of the inside diameter of the pipe or 1/4 inch, whichever is larger.

B. Do not allow the horizontal alignment of the pipe to vary from design line at any point along the pipe by more than 1% of the inside diameter of the pipe.

C. Low spots holding water exceeding the following depths for each pipe size will be considered unacceptable and must be removed and reinstalled to proper grade.

Pipe Diameter	Maximum Low Spot Depth
8”	1/2”
10”	1/2”
12”	3/4”
15”	3/4”
18” and Larger	5% of Pipe Diameter*

* Measured to the nearest 1/2”

3.08 CONFLICTS

A. Horizontal Separation of Gravity Storm Sewers from Water Mains: Separate storm sewers and water mains by at least 10 feet measured edge to edge unless it is impossible to do so. When not possible to maintain a 10 feet horizontal separation, maintain a minimum separation of 3 feet and utilize one of the following within 10 feet measured edge to edge:

1. Construct the water main of ductile iron pipe with gaskets impermeable to hydrocarbons.

2. Enclose the water main in a watertight casing pipe with evenly spaced annular gap and watertight end seals.

3. Construct storm sewer pipe of water main materials.

4. Construct storm sewers of reinforced concrete pipe with gaskets manufactured according to ASTM C 443.

B. Separation of Storm Sewer Force Mains from Water Mains: Separate storm sewer force mains and water mains by a horizontal distance of at least 10 feet unless:

5. The force main is constructed of water main materials meeting a minimum pressure rating of 150 psi and the requirements of Section 33 14 16 and

6. The sewer force main is laid at least 4 linear feet from the water main.

C. Vertical Separation of Storm Sewers and Water Main Crossovers:

7. Vertically separate storm sewers from water mains by at least 18 inches measured between the outside edges of the water main and the storm sewer. Maintain the maximum feasible separation distance in all cases. Ensure the sewer and water pipes are adequately supported. Use a low permeability soil for backfill material

within 10 feet of the point of crossing.

8. When impossible to maintain an 18 inch vertical separation when the water main crosses over the storm sewer, maintain a minimum vertical separation of 6 inches and utilize one of the following within 10 feet measured edge-to-edge centered on the crossing:
   a. Construct the water main of ductile iron pipe with gaskets impermeable to hydrocarbons.
   b. Enclose the water main in a watertight casing pipe with evenly spaced annular gap and watertight end seals.
   c. Construct storm sewer pipe of water main materials.
   d. Construct storm sewers of reinforced concrete pipe with gaskets manufactured according to ASTM C 443.

3.09 STORM SEWER ABANDONMENT

A. Plug:

1. Prior to placing the sewer plug, the Engineer will verify the sewer line is not in use.

2. Construct sewer plug by completely filling the end of the pipe with concrete. Force concrete into the end of the pipe for a distance of 16 inches, or one-half the pipe diameter, whichever is greater.

B. Fill:

1. Prior to filling the sewer, the Engineer will verify the sewer line is not in use.

2. If specified in the contract documents, fill the line to be abandoned with flowable mortar, foamed cellular concrete, or CLSM (comply with Section 31 23 33) by gravity flow or pumping.

3. Batching, mixing, and placing may be started when temperature is 34°F and rising. Cease mixing and placing when temperature is 38°F or less and falling.

3.10 CONNECTION TO EXISTING MANHOLE OR INTAKE

Comply with Section 33 42 31, 3.05.

3.11 CLEANING, INSPECTION, AND TESTING

Clean, inspect, and test according to Section 33 01 12.

END OF SECTION

SECTION 33 42 31

STORM AND SANITARY STRUCTURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Manholes and Intakes for Storm Sewers

B. Manholes for Sanitary Sewers

C. Adjustment of Existing Manholes and Intakes

D. Connection to Existing Manholes and Intakes

E. Removal of Manholes and Intakes

F. Special Structures for Storm Sewers

G. Excavation and Backfill of Structures

1.02 DESCRIPTION OF WORK

A. Construct sanitary and storm sewer manholes to provide access to sewer systems for maintenance and cleaning purposes.

B. Construct storm sewer intakes for collection of surface water and conveyance to the storm sewer system.

C. Modify existing manholes and intakes as necessitated by other improvements adjacent to the manholes or intakes.

1.03 SUBMITTALS

Comply with General Provisions and Covenants, as well as the following:

A. Shop drawings of steel reinforcement, showing sizes, lengths, bends, and counts, if required.

B. Concrete mix design, if required by Engineer.

C. Shop drawing schedule of new manholes and/or intakes showing total depth, relative elevations of all connecting sanitary or storm sewer lines, all drops, and orientation of connecting lines.

D. Results of required testing.

E. Catalog cuts of iron castings and sewer line connection gaskets.

F. Gradation and soil classification reports for structure bedding and backfill materials.

G. Dewatering plan.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions, as well as the following:

A. Store reinforcing steel only on pallets or lagging.

B. Follow the aggregate storage and concrete transport requirements in Iowa DOT Article 2301.02, C.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions.

1.07 SPECIAL REQUIREMENTS

A. Do not place concrete when stormy or inclement weather will prevent good quality work.

B. Cold weather placement is restricted per Iowa DOT Article 2403.03, F.

PART 2 - PRODUCTS

2.01 MANHOLE AND INTAKE TYPES

Table 6010.01: Manhole and Intake Types

	SUDAS Figure No.	Type	Description
Sanitary Sewer Manholes	6010.301	SW-301	Circular Sanitary Sewer Manhole
	6010.302	SW-302	Rectangular Sanitary Sewer Manhole
	6010.303	SW-303	Sanitary Sewer Manhole Over Existing Sewer
	6010.304	SW-304	Rectangular Base/Circular Top Sanitary Sewer Manhole
	6010.305	SW-305	Tee-section Sanitary Sewer Manhole
Storm Sewer Manholes	6010.401	SW-401	Circular Storm Sewer Manhole
	6010.402	SW-402	Rectangular Storm Sewer Manhole
	6010.403	SW-403	Deep Well Rectangular Storm Sewer Manhole
	6010.404	SW-404	Rectangular Base/Circular Top Storm Sewer Manhole
	6010.405	SW-405	Tee-section Storm Sewer Manhole
	6010.406	SW-406	Shallow Rectangular Storm Sewer Manhole
Intakes	6010.501	SW-501	Single Grate Intake
	6010.502	SW-502	Circular Single Grate Intake
	6010.503	SW-503	Single Grate Intake with Manhole
	6010.504	SW-504	Single Grate Intake with Flush-top Manhole
	6010.505	SW-505	Double Grate Intake
	6010.506	SW-506	Double Grate Intake with Manhole
	6010.507	SW-507	Single Open-throat Intake, Small Box
	6010.508	SW-508	Single Open-throat Intake, Large Box
	6010.509	SW-509	Double Open-throat Intake, Small Box
	6010.510	SW-510	Double Open-throat Intake, Large Box
	6010.511	SW-511	Rectangular Area Intake
	6010.512	SW-512	Circular Area Intake
	6010.513	SW-513	Open-sided Area Intake
	6010.515	SW-515	Triple Rectangular Area Intake
	6010.541	SW-541	Open-Throat Curb Intake Under Pavement
	6010.542	SW-542	Extension Unit for Open-Throat Curb Intake Under Pavement

	6010.545	SW-545	Single Open-Throat Curb Intake with Extended Opening

2.02 PRECAST

Comply with ASTM C 478 (circular) and ASTM C 913 (rectangular).

2.03 CAST-IN-PLACE

A. Concrete: Use Class C concrete. Comply with the following Iowa DOT Specifications and Materials I.M.s.

1. **Iowa DOT Specifications Sections:**
   a. 2403 – Structural Concrete
   b. 4101 – Portland Cement
   c. 4102 – Water for Concrete and Mortar
   d. 4103 – Liquid Admixtures for Portland Cement Concrete
   e. 4104 – Burlap for Curing Concrete
   f. 4106 – Plastic Film and Insulating Covers for Curing Concrete
   g. 4108 – Supplementary Cementitious Materials
   h. 4109 – Aggregate Gradations
   i. 4110 – Fine Aggregate for Portland Cement Concrete
   j. 4115 – Coarse Aggregate for Portland Cement Concrete

2. **Iowa DOT Materials I.M.s:**
   a. 316 – Flexural Strength of Concrete
   b. 318 – Air Content of Freshly Mixed Concrete by Pressure
   c. 403 – Chemical Admixtures for Concrete
   d. 528 – Structural Concrete Plant Inspection
   e. 529 – Portland Cement Concrete Proportions
   f. 534 – Mobile Mixture Inspection

B. Reinforcement: Comply with Iowa DOT Section 4151 for epoxy coated reinforcement.

2.04 NON-SHRINK GROUT

Comply with Iowa DOT Materials I.M. 491.13.

2.05 PRECAST RISER JOINTS

A. Joint Ends:

1. Use tongue and groove ends.

2. If cast-in-place base is used, provide bottom riser with square bottom edge.

B. Joint Sealant:

1. **Sanitary Sewers:**
   a. Rubber O-ring or Profile Gasket: Flexible joint, complying with ASTM C 443.
   b. Bituminous Jointing Material: Use a cold-applied mastic sewer joint sealing compound recommended by the manufacturer for the intended use and approved by the Engineer. Comply with ASTM C 990.
   c. Butyl Sealant Wrap: Comply with ASTM C 877.

2. **Storm Sewers:** All joint sealants used on sanitary sewers may also be used for storm sewers. The following may also be used.

a. **Rubber Rope Gasket Jointing Material:** Comply with ASTM C 990.
b. **Engineering Fabric Wrap:** If specified in the contract documents, supply engineering fabric wrap complying with Iowa DOT Article 4196.01, B.

2.06 MANHOLE OR INTAKE TOP

A. Capable of supporting HS-20 loading.

B. Use eccentric cone on sanitary sewer manholes unless otherwise specified or allowed.

2.07 BASE

A. Sanitary Sewer Manhole:

1. **Circular Manhole:** Integral base and lower riser section according to ASTM C 478.

2. **All Other Manholes:** Use precast or cast-in-place concrete base.

B. Storm Sewer Manhole: Use precast or cast-in-place concrete base.

C. Intake: Use precast or cast-in-place concrete base.

2.08 PIPE CONNECTIONS

A. Flexible, Watertight Gasket: Comply with ASTM C 923.

B. Non-Shrink Grout: Comply with Section 33 42 31, 2.04.

C. Waterstop: Provide elastomeric gasket that surrounds pipe and attaches with stainless steel bands and is designed to stop the movement of water along the interface between a pipe and a surrounding concrete collar.

D. Concrete Collar: Comply with Section 33 42 31, 2.02 and 2.03.

2.09 MANHOLE OR INTAKE ADJUSTMENT RINGS (Grade Rings)

A. Use one of the following materials for grade adjustments of manhole or intake frame and cover assemblies:

1. Reinforced Concrete Adjustment Rings: Comply with ASTM C 478. Provide rings free from cracks, voids, and other defects.

2. High Density Polyethylene Adjustment Rings: Comply with ASTM D 1248 for recycled plastic.
   a. Test and certify material properties by the methods in the following table.

Table 6010.02: Test Methods

Property	Test Method	Acceptable Value
Melt Flow Index	ASTM D 1238	0.30 to 30 g/10 min.
Density	ASTM D 792	0.94 to 0.98 g/cm^3
Tensile Strength	ASTM D 638	2,000 to 5,000 lb/in^2

   b. Do not use polyethylene grade adjustment rings when they are exposed to heat shrink infiltration barriers.

c. When used in a single configuration, provide tapered adjustment ring with thickness that varies from 1/2 inch to 3 inches.
d. Install adjustment rings on clean, flat surfaces according to the manufacturer's recommendations. Comply with ASTM D 36 with minimum 350°F softening point for butyl rubber sealant.

3. Expanded Polypropylene Adjustment Rings: Comply with ASTM D 4819 for expanded polypropylene when tested according to ASTM D 3575.
   a. Use adhesive meeting ASTM C 920, Type S, Grade N5, Class 25.
   b. Provide finish rings with grooves on the lower surface and flat upper surface.
   c. Do not use when heat shrinkable infiltration barrier is used.

B. Ensure the inside diameter of the adjustment ring is not less than the inside diameter of the manhole frame or not less than the inside dimension of the intake grate opening.

2.10 CASTINGS (Ring, Cover, Grate, and Extensions)

A. Gray Cast Iron: AASHTO M 306.

B. Ductile Iron: ASTM A 536, Grade 80-55-06 or 70-50-05.

C. Composite: AASHTO M 306.

1. **Hardware:** Attach lid to frame with 316 stainless steel hardware.

2. **Slip Resistance:** Greater than 0.6 when tested according to ASTM C 1028.

3. **Ultraviolet Resistance:** Meet ASTM G 154 Cycle 1 for a minimum of 1,000 hours.

4. **Detection:** Must be detectable using standard detection equipment.

D. Load Capacity: Standard duty unless otherwise shown on the casting figures.

1. **Standard Duty:** Casting certified for 40,000 pound proof-load according to AASHTO M 306.

2. **Light Duty:** Casting certified according to requirements of AASHTO M 306 for a 16,000 pound proof-load (HS-20). 40,000 pound proof-load is not required.

E. Casting Types:

1. **Manholes:** The following table lists the manhole casting types.

Table 6010.03: Manhole Casting Types

	Figure No.	Casting Type	Number of Pieces	Ring/ Cover	Bolted Frame	Bolted Cover (Floodable)	Gasket
Sanitary Sewer	6010.601	SW-601, A	2	Fixed	Yes	No	Yes[1]
	6010.601	SW-601, B	3	Adjustable	No	No	Yes[1]
	6010.601	SW-601, C	2	Fixed	Yes	Yes	Yes[1]
	6010.601	SW-601, D	3	Adjustable	No	Yes	Yes[1]
	6010.602	SW-602, E[2]	2	Fixed	Yes	No	No

	6010.602	SW-602, F[2]	3	Adjustable	No	No	No
	6010.602	SW-602, G[2]	2	Fixed	No	No	No

[1] Machine bearing surfaces required.
[2] Storm sewer casting may include environmental symbols and/or messages such as "DUMP NO WASTE, DRAINS TO RIVER."

2. Intakes:
a. Comply with SUDAS Figures 6010.602, 6010.603, 6010.604, and the contract documents.
b. Castings may include environmental symbols and/or messages such as "DUMP NO WASTE, DRAINS TO RIVER."

3. Manhole Casting Extension Ring:
a. Match the dimensions of the existing ring and cover with an allowable diameter tolerance of -1/4 inch for the frame ridge and +1/4 inch for the cover recess.
b. Provide extension ring with height as required to raise the top of the casting to make it level or no more than 1/4 inch below the finished pavement surface. Maximum ring height is 3 inches.

2.11 ADDITIONAL MATERIALS FOR SANITARY SEWER MANHOLES

A. Infiltration Barrier:

1. External Chimney Seal:
a. Rubber Sleeve and Extension:
1) Corrugated; minimum thickness of 3/16 inches, according to ASTM C 923.
2) Minimum allowable vertical expansion of at least 2 inches.
b. Compression Bands:
1) One-piece band assembly to compress sleeve or extension against manhole and casting surfaces.
2) 16 gauge ASTM C 923, Type 304 stainless steel, minimum 1 inch width, minimum adjustment range of 4 inches more than the manhole outside diameter.
3) For standard two-piece castings, shape top band to lock sleeve to manhole frame's base flange. For three-piece adjustable castings, shape top band to lock sleeve to upper piece of adjustable frame.
4) Stainless steel fasteners complying with ASTM F 593 and 594, Type 304.

2. Internal Chimney Seal:
a. Rubber Sleeve and Extension:
1) Double pleated, minimum thickness 1/8 inch thick, according to ASTM C 923.
2) Minimum allowable vertical expansion of at least 2 inches.
3) Integrally formed expansion band recess top and bottom with multiple sealing fins.
b. Expansion Bands:
1) One-piece band assembly to compress sleeve or extension against manhole and casting surfaces to make a watertight seal.
2) 16 gauge ASTM C 923, Type 304 stainless steel, minimum 1 inch width, minimum adjustment range of 2 inches more than the manhole inside diameter.
3) Positive stainless steel locking mechanism permanently securing the band in its expanded position after tightening.

3. Molded Shield:
a. Barrier Shield:

1) Medium density polyethylene, according to ASTM D 1248.
2) Certified for 40,000 pound proof-load according to AASHTO M 306.
3) Diameter to match cone section and internal dimension of casting.

b. Sealant: Butyl material meeting ASTM C 990.

4. Heat Shrink Sleeve: Heat-shrinkable wrap around sleeve designed for protection of buried and exposed sanitary sewer manholes. Do not use with polypropylene or polyethylene adjustment rings.

a. Primer: Compatible with concrete, ductile and cast iron, and sleeve material.

b. Sleeve and Backing:

Property	Standard	Value
Water Absorption	ASTM D 570	0.05% maximum
Low Temperature Flexibility	ASTM D 2671	-40° F
Tensile Strength	ASTM D 638	2,900 psi minimum
Elongation	ASTM D 638	600% minimum
Hardness	ASTM D 2240	Shore D: 46
Shrink Factor	---	40% minimum
Thickness	---	0.1 inch minimum

c. Adhesive: Softening point of 212° F maximum meeting ASTM E 28.

B. Riser Section Coating:

1. Exterior: When exterior waterproof coating is specified, provide bituminous or coal tar coating.

2. Interior: When interior manhole lining is specified, provide lining according to Section 33 31 13 (lined, reinforced concrete pipe).

2.12 CONCRETE FILLET

A. Cast-in-place Base: Provide a cast-in-place concrete fillet with concrete complying with the requirements of Section 33 42 31, 2.03.

B. Precast Base Section:

1. For sanitary sewers, provide a precast concrete fillet, unless otherwise allowed by the Engineer. Comply with Section 33 42 31, 3.01.

2. For storm sewers, provide a cast-in-place concrete fillet with concrete complying with the requirements of Section 33 42 31, 2.03.

2.13 STEPS

A. Depths:

1. For manholes and intakes less than 20 feet deep, do not install steps unless otherwise specified in the contract documents.

2. For manholes and intakes deeper than 20 feet, install steps to meet OSHA regulations.

B. Requirements:

1. ASTM C 478.

2. Manufacture using polypropylene encased steel.

3. Uniformly space steps at 12 to 16 inches.

4. Align with vertical side of eccentric top section.

5. Place first step no more than 36 inches from top of casting.

2.14 PRECAST CONCRETE TEE

A. Tee and Eccentric Reducers: ASTM C 478.

B. Composite Tee: Comply with SUDAS Figure 6010.305. May be substituted for pipe diameters less than 48 inches.

2.15 CASTING ANCHOR BOLTS AND WASHERS

A. Material: Stainless steel or hot-dipped galvanized.

B. Diameter: Provide bolts and washers 1/8 inch smaller than hole or slot in the casting frame, but no less than 1/2 inch diameter.

C. Bolt Length: As required to pass through adjustment rings and into manhole or intake structure to embedment depth recommended by anchor manufacturer.

2.16 DROP CONNECTION

A. Internal:

1. **Receiving Bowl:** Marine grade fiberglass meeting ASTM D 790, ASTM D 638, and ASTM D 2583 with non-magnetic stainless steel anchor bolts meeting the manufacturer's recommendation.

2. **Flexible Coupler:** Provide flexible couple matching the size of the receiving bowl and the drop pipe.

3. **Drop Pipe and Bottom Elbow:** Provide drop pipe an equivalent diameter of the influent pipe. Limit pipe size to maintain space available for maintenance activities. Provide solid wall SDR 35 PVC pipe and elbow complying with Section 33 42 11 or Schedule 40 PVC pipe and elbow complying with ASTM D 1785.

4. **Pipe Brackets:** ASTM A 240, Type 304 or Type 316 stainless steel with stainless steel nuts and bolts.

B. External:

1. **Pipe and Fittings:** Comply with Section 33 14 16 for ductile iron pipe and fittings.

2. **Concrete Encasement:** Comply with Section 32 13 13.

3. **Embedment Material:** Comply with Section 31 23 33 for backfill material from the top of the elbow to the bottom of the sewer main.

2.17 EXCAVATION AND BACKFILL MATERIAL

Comply with Section 31 23 33 for bedding and backfill materials.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS FOR INSTALLATION OF MANHOLES AND INTAKES

A. Excavation: Excavate according to Section 31 23 33.

B. Subgrade Preparation:

1. **Cut Sections (Undisturbed Soil):** Prepare subgrade to accurate elevation required to place subbase.

2. **Fill Sections:** Compact to 95% of maximum Standard Proctor Density and hand grade to accurate elevation required to place subbase, or install stabilization material as directed by the Engineer.

3. **Unstable Soil:** Install stabilization material as directed by the Engineer.

C. Subbase: Install 8 inch thick pad of Class I bedding material a minimum of 12 inches outside footprint of the structure.

D. Installation of Manhole or Intake Structure: When necessary, adjust wall height and depth of base to provide a minimum of 48 inches between form grade elevation and top of base. Form walls and construction joints for cast-in-place intakes or install precast intake boxes to ensure intake lids are set to match the longitudinal slope of the adjacent street unless otherwise specified in the contract documents.

1. **Cast-in-place:** Comply with Section 33 42 31, 3.02.

2. **Precast:** Comply with Section 33 42 31, 3.03.

E. Pipes: Install and bed pipes and connect to manhole or intake. Install pipe flush with inside wall of structure. Place bedding and pipe embedment material according to Section 31 23 33.

1. **Cast-in-place Structures:**
   a. **Storm:** Form structure walls around pipe.
   b. **Sanitary:** Form or core circular opening and install flexible, watertight gasket according to Section 33 42 31, 2.08. Keep void between pipe and manhole section free of debris and concrete.

2. **Precast Storm Sewer Manholes or Intakes:** If annular space between pipe and structure is less than 2 inches, fill with non-shrink grout. If annular space is 2 inches or greater, construct a concrete collar around the pipe according to Section 33 42 31, 3.05.

3. **Precast Sanitary Sewer Manholes:** Connect to structure with flexible, watertight gasket according to Section 33 42 31. Keep void between pipe and manhole section free of debris and concrete.

4. **Sanitary Sewer Manholes on Existing Pipe:** Install waterstop according to Section 33 42 31, 2.08.

F. Joint Sealant:

1. **Sanitary Sewer Manholes:**
   a. Install rubber O-ring or profile gasket (precast structures).
   b. Apply bituminous jointing material or butyl sealant wrap to exterior of all sanitary sewer manhole joints.

2. **Storm Sewer Manhole and Intakes:**
   a. Apply bituminous jointing material or install rubber rope gasket.
   b. If indicated in the contract documents, apply engineering fabric wrap to joints.

G. Fillet:

1. Construct manhole or intake fillet up to one-half of pipe diameter to produce a smooth half-pipe shape between pipe inverts.

2. Slope fillet top toward pipe 1/2 inch per foot perpendicular to flow line.

3. For sanitary sewer, keep void between pipe and structure wall free of debris and concrete.

4. For precast fillets, remove any projections and repair any voids to provide a hydraulically smooth channel between ends of pipes.

H. Top Sections: Install manhole eccentric cone or flat top section or install intake top.

I. Adjustment Ring(s):

1. Bed each concrete ring with bituminous jointing material in trowelable or rope form.

2. Bed each polyethylene or expanded polypropylene ring with manufacturer's approved product and according to manufacturer's recommended installation procedure.

3. Construct manholes and intakes with the following adjustment ring stack heights:
   a. Minimum: 4 inches for new manholes and intakes. No minimum for rehabilitation projects.
   b. Maximum: 12 inches for new manholes and intakes; 16 inches for existing manholes and intakes.

4. For greater adjustment, modify lower riser section(s).

J. Casting:

1. Install the type of casting specified in the contract documents and adjust to proper grade.

2. Where a manhole or intake is to be in a paved area, adjust the casting to match the slope of the finished surface.

3. Three-piece Castings:
   a. Attach the frame to the structure with four anchor bolts.
   b. Set initial position of movable portion of the casting in the center of the adjustment range.
   c. Remove height-adjustment bolts or mechanism after the paving is completed.

K. Infiltration Barrier: Install on sanitary sewer manholes.

1. **Internal or External Chimney Seal:**
   a. Do not use external chimney seal if seal will be permanently exposed to sunlight.
   b. Extend seal 3 inches below the lowest adjustment ring.
   c. Extend seal to 2 inches above the flange of the casting for a standard two-piece casting, or 2 inches above the top of the base section of the casting for an adjustable three-piece casting.
   d. Use multiple seals, if necessary.
   e. Install compression bands (external chimney seal) or expansion bands (internal chimney seal) to lock the rubber sleeve or extension into place and to provide a positive watertight seal. Once tightened, lock the bands into place. Use only manufacturer recommended installation tools and sealants.

2. **Molded Shield:**
   a. Clean surface of structure cone section.
   b. Apply sealant to the top surface of the cone section. Use sufficient sealant to accommodate flaws in the surface of the cone section.
   c. Cut molded shield to height by adding the dimensions of the adjustment rings and casting height. Be sure not to interfere with seating of the lid into the casting frame.
   d. Seat the molded shield against the sealant on the cone section.
   e. Add adjustment rings and casting to meet final grade.

3. **Heat Shrink Sleeve:**
   a. Ensure all surfaces are clean, dry, and free of foreign objects and sharp edges.
   b. Warm the surface to drive off any moisture.
   c. Cut sleeve to required length per manufacturer's requirements.
   d. Apply primer to manhole and casting surface.
   e. Place sleeve according to manufacturer's requirements.
   f. Apply heat to the sleeve, smooth out wrinkles, and remove trapped air.
   g. Cut the sleeve at the casting gussets. Reheat to place the sleeve onto the casting.
   h. Trim off any excess material.

L. Backfill and Compaction:

1. Place suitable backfill material after concrete in structure has reached at least 3,000 psi compressive strength or 550 psi flexural strength. If concrete strength is not determined, place backfill at least 14 calendar days after initial concrete placement.

2. Place backfill material simultaneously on all sides of walls and structures so the fill is kept at approximately the same elevation at all times.

3. Compact the 3 feet closest to all walls using pneumatic or hand tampers only. Ensure proper and uniform compaction of backfill around structure.

3.02 ADDITIONAL REQUIREMENTS FOR CAST-IN-PLACE CONCRETE STRUCTURES

A. Forms:

1. Comply with Iowa DOT Article 2403.03, B.

2. Form all cast-in-place manholes and intakes on both the inside and the outside face above the base. Do not form against excavated earthen surface.

B. Reinforcing Steel:

1. Comply with Iowa DOT Section 2404.

2. Lap bars a minimum of 36 diameters, unless otherwise specified in the contract documents.

3. Provide a minimum of 3 inches of clearance for structure bases and 2 inches of clearance for walls and tops.

C. Concrete Mixing:

1. Comply with Iowa DOT Article 2403.02, D.

2. When using ready-mixed concrete, comply with ASTM C 94.

D. Concrete Placing:

1. Comply with Iowa DOT Article 2403.03, C.

2. Do not place concrete when the air temperature is less than 40°F without the approval of the Engineer. When placement of concrete below 40°F is allowed, comply with Iowa DOT Article 2403.03, F.

3. Place concrete continuously in each section until complete. Do not allow more than 30 minutes to elapse between depositing adjacent layers of concrete within each section.

4. Comply with Iowa DOT Article 2403.03, D for concrete vibration.

5. Form 1 1/2 inch by 3 inch keyed construction joints at locations shown in the contract documents.

6. Provide a broom finish on portions of structure that are to become part of exposed pavement.

E. Stripping and Cleaning:

1. Remove forms for manhole and intake walls and tops according to Iowa DOT Article 2403.03, M. References to culverts include all sanitary and storm structures. When allowed by the Engineer, compressive strengths at six times the stated flexural strengths may be used in determining concrete strength of structure tops.

2. Finish surfaces according to Iowa DOT Article 2403.03, P. Give exposed surfaces a Class 2 finish.

F. Curing:

1. Comply with Iowa DOT Article 2403.03, E.

2. For surfaces visible to the public, use only curing compounds complying with ASTM C 309, Type 1-D or Type 2.

G. Exterior Loading:

1. Restrict exterior loads on concrete according to Iowa DOT Article 2403.03, N.

2. When allowed by the Engineer, compressive strengths at six times the stated

flexural strengths may be used.

H. Repairs: After visual inspection of the completed manhole or intake, repair honeycomb areas, visible leaks, tie holes, or other damaged areas. Remove concrete webs or protrusions.

I. Concrete Testing: The Engineer will conduct testing.

3.03 ADDITIONAL REQUIREMENTS FOR PRECAST CONCRETE STRUCTURES

A. Substitutions: If approved by the Engineer, precast structures may be substituted for designated cast-in-place structures. Comply with the requirements of Section 33 42 31, 3.02 or Iowa DOT Materials I.M. 445.

B. Cast-in-place Base:

1. Comply with Section 33 42 31, 3.02 for placement of concrete.

2. Ensure proper vertical and horizontal alignment of base riser section.

C. Precast Base or Base with Integral Riser Section: Place base or base with integral riser section and ensure proper vertical and horizontal alignment.

D. Additional Riser Sections: Install additional riser sections as required.

E. Lift Holes: Install rubber plug in lift holes. Cover plug and hole with non-shrink grout.

3.04 ADJUSTMENT OF EXISTING MANHOLE OR INTAKE

A. Casting Extension Rings:

1. Install casting extension rings only when specified in the contract documents, and only in conjunction with pavement overlays.

2. Install according to the manufacturer's recommendation and adjust for proper alignment.

B. Minor Adjustment (Adding or Removing Adjustment Rings):

1. Remove casting.

2. Modify adjustment ring stack height by one of the following methods:
   a. Add adjustment rings as necessary to adjust existing manhole or intake to finished pavement grade or finished topsoil grade, to a maximum ring stack height of 16 inches. Bed each concrete ring with bituminous jointing material. Bed each
   polyethylene ring with manufacturer's approved product.
   b. Remove one or more adjustment rings, as appropriate, to reduce casting elevation.

3. Install new casting on modified adjustment ring stack. Existing casting may be reinstalled when specified in the contract documents.

4. Replace infiltration barrier for sanitary sewer manhole using only new materials.

C. Major Adjustment (Adding, Removing, or Modifying Riser or Cone Section): When adjustment is greater than can be accomplished through adding or removing

adjustment rings, a major adjustment will be required.

1. Remove casting.

2. Remove top.

3. Remove and replace or modify existing riser section and/or top section according to the method approved by the Engineer.

4. Install new frame and cover or grate. Existing casting may be reinstalled when specified in the contract documents.

5. Replace infiltration barrier for sanitary sewer manhole using only new materials.

3.05 CONNECTION TO EXISTING MANHOLE OR INTAKE

A. General:

1. Remove existing fillet as necessary to install pipe at required elevation and develop hydraulic channel.

2. Insert pipe into structure and trim end flush with inside wall of structure.

3. Place backfill material according to Section 31 23 33.

B. Concrete Collar:

1. For new pipes 12 inches or smaller, install two number 4 steel reinforcing hoops in collar around pipe. Pour concrete collar around pipe/structure junction to a minimum thickness and width of 6 inches, providing a minimum of 4 inches of concrete extending beyond the pipe opening.

2. For new pipes larger than 12 inches, install two number 4 steel reinforcing hoops in collar around pipe. Pour concrete collar around pipe/structure junction to minimum thickness and width of 9 inches, providing a minimum of 4 inches of concrete extending beyond the pipe opening.

C. Sanitary Sewer:

1. **General:**
   a. Core new openings in existing manholes unless otherwise specified in the contract documents.
   b. Divert flow as necessary. Obtain approval of the diversion plan from the Engineer. Maintain sanitary sewer service at all times unless otherwise specified in the contract documents.

2. **Cored Opening:**
   a. Insert flexible watertight connector into new opening.
   b. Install and tighten internal expansion sleeve to hold flexible connector in place.
   c. Insert pipe through flexible connector and tighten external compression ring.
   d. Do not install grout or concrete collar for cored opening with flexible connector.

3. **Cut and Chipped Opening (Knock-out):** Use only when specified or allowed.
   a. Saw opening to approximate dimensions with a masonry saw. Saw to depth sufficient to sever reinforcing steel.
   b. Remove concrete and expand opening to a diameter at least 6 inches larger than

the outside diameter of the new pipe.

c. Cut off all reinforcing steel protruding from the structure wall.
d. Install waterstop around new pipe centered within structure wall.
e. Fill opening between structure and pipe with non-shrink grout.
f. Construct concrete collar around pipe and exterior manhole opening.
g. Provide pipe joint, non-shear coupling, or other approved flexible coupling within 2 feet of structure wall to allow for differential settlement between the new sewer and the structure.

D. Storm Sewer:

1. Cut and Chipped Opening:

a. Use for pipe sizes 12 inches in diameter or larger.
b. Saw opening to approximate dimensions with a masonry saw. Saw to depth sufficient to sever reinforcing steel.
c. Remove concrete and expand opening to a diameter at no more than 4 inches larger than the outside diameter of the new pipe.
d. Leave a minimum of 6 inches of manhole or intake wall above and on the sides of the pipe.
e. Cut off all reinforcing steel protruding from the structure wall.

2. Cored Opening:

a. Core new openings in existing manholes or intakes for all pipes less than 12 inches in diameter.
b. Opening to be no greater than 2 inches larger than the outside diameter of the pipe.
c. Leave a minimum of 6 inches of manhole or intake wall above and on the sides of the pipe.

3. Fill Opening: Fill opening between manhole or intake wall and outside of pipe with non- shrink grout or construct a concrete collar around the pipe according to Section 33 42 31, 3.05, B.

3.06 DROP CONNECTION TO SANITARY SEWER MANHOLE

A. Internal:

1. Core opening in existing manhole wall and install flexible watertight connector.

2. Cut incoming pipe so a maximum of 2 inches extends into the manhole.

3. Allow 1 inch clearance between bottom of incoming pipe and top of the receiving bowl. Connect receiving bowl to manhole with stainless steel anchor bolts as recommended by the manufacturer.

4. Install flexible coupler connecting the receiving bowl and the drop pipe.

5. Mount drop pipe on the side of the manhole with stainless steel brackets spaced a maximum of 4 feet apart. Provide a minimum of two brackets per pipe segment.

6. Remove existing concrete fillet as required to accommodate bottom elbow.

7. Install elbow at bottom of drop pipe to match concrete fillet and create a smooth flow transition. Align elbow so discharge is directed at outlet pipe or at 45 degrees to manhole flow.

8. Repair fillet according to Section 33 42 31, 3.01, G.

9. Comply with SUDAS Figure 6010.308.

B. External:

1. Core opening in existing manhole wall and install flexible watertight connector, if required.

2. Install ductile iron pipe and fittings according to Section 33 14 16.

3. Place concrete from the base of the manhole to the top of the elbow.

4. Comply with Section 31 23 33 for bedding and backfill of the external drop piping.

5. Comply with SUDAS Figure 6010.307.

3.05 REMOVAL OF MANHOLE OR INTAKE

A. Unless otherwise specified, remove the entire structure to a minimum of 10 feet below top of subgrade in paved areas or 10 feet below finished grade in other areas.

B. Pipes:

1. Contact the Engineer to verify the sewer line is not in use.

2. Construct sewer plug by completely filling the end of the pipe with concrete. Force concrete into the end of the pipe for a distance of 16 inches, or one-half the pipe diameter, whichever is greater.

3. If specified in the contract documents, fill the line to be abandoned with flowable mortar or CLSM (comply with Section 31 23 33) by gravity flow or pumping.

C. Fill remaining structure using flowable mortar.

D. Place compacted backfill over remaining structure as required for embankment or compacted backfill.

3.06 CLEANING, INSPECTION, AND TESTING

Clean, inspect, and test structures according to Section 33 01 12.

END OF SECTION

SECTION 33 42 32
CLEANING, INSPECTION, AND TESTING OF STRUCTURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cleaning, inspecting, and testing sanitary sewer manholes.

B. Cleaning and inspecting storm sewer manholes, intakes, and other utility structures.

1.02 DESCRIPTION OF WORK

A. Clean, inspect, and test sanitary sewer manholes.

B. Clean and inspect storm sewer manholes, intakes, and other utility structures.

1.03 SUBMITTALS

Comply with General Provisions.

1.04 SUBSTITUTIONS

Comply with General Provisions.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with General Provisions.

1.06 SCHEDULING AND CONFLICTS

Comply with General Provisions, as well as the following:

A. Notify the Engineer at least 24 hours prior to performing testing.

B. The Engineer must be present to review testing procedures and record results.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

Cleaning, inspection, and testing of structures are incidental to construction of structures and will not be paid for separately.

PART 2 - PRODUCTS

None.

PART 3 - EXECUTION

3.01 CLEANING

A. Clean all manholes, intakes, and structures by removing sheeting, bracing, shoring, forms, soil sediment, concrete waste, and other debris.

B. Do not discharge soil sediment or debris to drainage channels or existing storm sewer or sanitary sewer system.

3.02 VISUAL INSPECTION

A. Examine structure for:

1. Damage.

2. Slipped forms.

3. Indication of displacement of reinforcement.

4. Porous areas or voids.

5. Proper placement of seals, gaskets, and embedments.

B. Verify that the structure is set to true line, grade, and plumb.

C. Verify structure dimensions and thicknesses.

3.03 REPAIR

Comply with Section 33 42 31 for repairs.

3.04 SANITARY SEWER MANHOLE TESTING

A. General:

1. Use vacuum testing for sanitary sewer manholes, unless exfiltration testing is specified in the contract documents.

2. Conduct the final test after manhole construction is complete, all repairs and connections have been made, and the invert has been installed.

B. Vacuum Test:

1. Applicable only for new manholes isolated from connecting sewer lines.

2. Use manufactured vacuum test equipment meeting the Engineer's approval. Follow the equipment manufacturer's recommended procedures throughout, unless directed otherwise by the Engineer or these specifications.

3. Use extreme care and follow safety precautions during testing operations. Keep personnel clear of manholes during testing.

4. Seal all openings except manhole top access using pneumatic plugs rated for test pressures. Install plugs according to the test equipment manufacturer's recommendations.

5. Brace pipe inverts if backfill material has not been placed around connecting pipes.

6. Install the vacuum tester head assembly on the manhole top access, and inflate the seal.

7. Evacuate the manhole to 5 psi or 10 inches mercury (Hg). Close the isolation valve and start the test. Record the starting time.

8. Maintain a vacuum in the manhole for the time indicated in the following table for the diameter and depth of manhole being tested.

9. Test failure is indicated by vacuum loss greater than 0.5 psi or 1 inch mercury (Hg) within the minimum test time indicated in the table below for the depth and diameter of the manhole being tested.

Table 6030.01: Minimum Vacuum Test Times for Various Manhole Diameters

Depth (feet)	Diameter (inches)				
	48	54	60	66	72
	Time (seconds)				
8	20	23	26	29	33
10	25	29	33	36	41
12	30	35	39	43	49
14	35	41	46	51	57
16	40	46	52	58	67
18	45	52	59	65	73
20	50	53	65	72	81
22	55	64	72	79	89
24	59	64	78	87	97
26	64	75	85	94	105
28	69	81	91	101	113
30	74	87	98	108	121

C. Exfiltration Test:

1. Testing may be performed in conjunction with sanitary sewer line testing. Comply with Section 33 31 14.

2. Do not test by this method if water may potentially freeze during the test.

3. Plug the manhole inlet and outlet.

4. Fill the manhole with water to 2 feet above the outside top of the connecting pipe. If ground water is present, fill the manhole to no less than 2 feet nor more than 5 feet above the ground water level. Do not fill above the top of the standard barrel sections.

5. Mark the water level.

6. Allow water to stand in the manhole for 1 hour, then refill to the original water level and begin the test.

7. Determine the allowable drop in water level by using the equation given in Section 33 31 14, 3.03. After 1 hour, measure the drop in water level.

8. Test failure is indicated by water loss greater than the maximum allowable calculated exfiltration.

3.04 TEST FAILURE

If testing fails, reseal the openings, repair the manhole, and retest. An alternate test method complying with these specifications may be used for a retest if desired.

END OF SECTION

2024-229

RESOLUTION ORDERING CONSTRUCTION OF THE LINN CREEK WATER PLAZA PROJECT #PRK22004, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND ESTIMATED COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS

WHEREAS, there is now on file in the office of the City Clerk proposed plans, specifications, form of contract, and estimated costs for the Linn Creek Water Plaza project, in the City of Marshalltown, Iowa, as is fully set forth in the plans and specifications for Project No PRK22004; and

WHEREAS, the cost of the said improvement is in excess of $25,000 and a public hearing on the plans, specifications, form of contract and the estimated cost of said improvement is required by law and that notice thereof shall be given as required by law; and

WHEREAS, it is intended that the cost of said improvement shall be paid from such funds as the City may legally use for such purposes or from the proceeds from the issuance of such bonds as may be legally issued for said purposes or any combination of the above methods of financing.

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

Section 1. This Council does hereby order the construction of the Linn Creek Water Plaza Project in the City of Marshalltown, Iowa, which public improvement is fully and particularly described in the plans and specifications for Project No. PRK22004, now on file in the office of the City Clerk of Marshalltown, Iowa.

Section 2. That the method of construction shall be by contract in accordance with the plans and specifications and general stipulations for the said improvement approved by the City Council.

Section 3. The Contractor will be paid in monthly estimates for work completed as set out in the specifications. The project shall begin on or near the appropriate starting date as specified on the form of proposal and shall be completed within the specified number of calendar days also indicated thereon.

Section 4. That the said improvements shall be paid for from such funds of the City as may be legally used for such purposes, or from the proceeds of the issuance of such bonds as may be legally issued for such purposes or from any combination of such methods of financing and will be paid in accordance with the Notice to Bidders duly published in connection therewith. The Finance Director shall establish on the books a Linn Creek Water Plaza Project fund and the bond proceeds or such funds of the City as may be legally used for such purposes are hereby appropriated to pay all costs of the improvements including legal publication, bond, design, engineering, survey and inspection, contract and contingency cost as estimated by the Engineer. The Finance Director is directed to advance all sums necessary from the project fund, and to set up on the books the obligations and receivables of the fund.

Section 5. The City Clerk is hereby directed to publish notice of hearing on plans, specifications, and form of contract and estimated cost in the manner provided by law for the public improvement outlined herein and that any person interested therein may appear and make objections thereto, if any he has. This Council will meet in the Council Chamber, Second Floor, 10 West State Street at Marshalltown, Iowa, at 5:30 P.M., local time on November 11, 2024, for the purpose of hearing all of said objections so made and for taking final action upon the plans, specifications, and form of contract now on file.

Section 6. Staff is further directed to advertise for bids in the manner provided by law for the construction of said improvements, setting forth in said notice such necessary pertinent information as will advise prospective bidders thereof together with the proposed manner of payment of the work to be constructed and that such bids be filed and received in the office of the City Clerk of Marshalltown, Iowa, up to 10:00 A.M., local time, on November 20, 2024. The bids will be opened, read, and tabulated by the Public Works Director or their designate at that time and will be acted upon by the City Council of said City at a meeting to be held in the Council Chambers, Second Floor, 10 West State Street, Marshalltown, Iowa, at 5:30 P.M., local time, on November 25, 2024, or at such later time and place as may then be fixed for considering such bids as shall be filed in connection with the improvement herein ordered and in compliance with the notice of taking bids therein, hereby ordered to be published.

Passed this 28th day of October 2024, and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

MARSHALLTOWN
IOWA
Parks & Recreation

Joel Greer, Mayor
Alicia Hunter, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5715
Fax - (641) 754-5717

To: Mayor Greer and the City Council
From: Geoff Hubbard, Parks & Recreation Director
Date: August 27, 2024
RE: Order Construction – Water Plaza – PRK22004

Policy Issue: City policy requires Governing Body approval of Resolution ordering construction.

Recommendation: Staff recommends approving the Resolution ordering construction of the Linn Creek Water Plaza – PRK22004.

Background: This project includes the construction of a water plaza and restroom building between Mega-10 Park and the Marshalltown Family Aquatic Center. This is one of four projects in the Linn Creek District that was partially funded by a $2 million Destination Iowa grant.

Budget Impact: This project will be funded with 364 funds, Destination Iowa grant, Wellmark grant, and private donations.

Attachment: None

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

City of Marshalltown
Water Plaza
OPINION OF PROBABLE COSTS
Thursday, October 24, 2024

Item No.	Description	Unit	Price	Quantity	Extension
1	CLEARING AND GRUBBING	LS	$ 5,000.00	1	$ 5,000.00
2	TOPSOIL, ON-SITE	CY	$ 40.00	850	$ 34,000.00
3	TOPSOIL, COMPOST AMENDED	CY	$ 85.00	90	$ 7,650.00
4	EXCAVATION, CLASS 10	CY	$ 25.00	1960	$ 49,000.00
5	SUBBASE, TEMPORARY GRANULAR MATERIAL	SY	$ 24.00	1615	$ 38,760.00
6	SUBBASE, MODIFIED, 4 INCHES	SY	$ 14.00	520	$ 7,280.00
7	SUBBASE, MODIFIED, 24 INCHES	SY	$ 70.00	929	$ 65,030.00
8	REMOVAL OF STRUCTURE, SANITARY LIFT STATION MANHJOLE	EA	$ 1,000.00	1	$ 1,000.00
9	COMPACTION TESTING	LS	$ 5,000.00	1	$ 5,000.00
10	SANITARY SEWER SERVICE	EA	$ 2,000.00	2	$ 4,000.00
11	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	$ 85.00	305	$ 25,925.00
12	STORM SEWER, TRENCHED, RCP, 24 INCH	LF	$ 150.00	8	$ 1,200.00
13	LINEAR TRENCH DRAIN (LEAPING JET TROUGH)	LS	$ 30,000.00	2	$ 60,000.00
14	PIPE APRON, RCP, 15 INCH	EA	$ 2,500.00	1	$ 2,500.00
15	PIPE APRON, RCP, 24 INCH	EA	$ 4,500.00	1	$ 4,500.00
16	SUBDRAIN, HDPE, 4 INCH	LF	$ 60.00	220	$ 13,200.00
17	SUBDRAIN CLEANOUT, 4 INCH	EA	$ 500.00	2	$ 1,000.00
18	WATER SERVICE PIPE, PVC, 2 INCH	LF	$ 32.00	363	$ 11,616.00
19	WATER SERVICE PIPE (TRENCHLESS), PVC, 2 INCH	LF	$ 100.00	230	$ 23,000.00
20	WATER SERVICE ABANDONMENT	EA	$ 1,000.00	1	$ 1,000.00
21	TAPPING VALVE ASSEMBLY, 2 INCH	EA	$ 2,500.00	1	$ 2,500.00
22	PACKAGE GRINDER LIFT STATION	EA	$ 30,000.00	1	$ 30,000.00
23	WATER MAIN MANHOLE, SW-401	EA	$ 6,000.00	1	$ 6,000.00
24	STORM SEWER OUTLET STRUCTURE	EA	$ 9,000.00	1	$ 9,000.00
25	STORM MANHOLE, SW-402	EA	$ 4,500.00	1	$ 4,500.00
26	SW-512, 18"	EA	$ 3,000.00	1	$ 3,000.00
27	PAVEMENT, PCC, 5 INCH	SY	$ 70.00	370	$ 25,900.00
28	PAVEMENT, PCC, 6 INCH REINFORCED (WET DECK)	SY	$ 140.00	820	$ 114,800.00
29	NON-SKID RUBBERIZED COATING	SF	$ 15.00	3290	$ 49,350.00
30	PCC PAVEMENT SAMPLES AND TESTING	LS	$ 10,000.00	1	$ 10,000.00
31	REMOVAL OF SIDEWALK	SY	$ 10.00	135	$ 1,350.00
32	FULL DEPTH PATCHES, PCC, 7 INCH	SY	$ 120.00	23	$ 2,760.00
33	TEMPORARY TRAFFIC CONTROL	LS	$ 15,000.00	1	$ 15,000.00
34	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 1 - PERMA	AC	$ 3,500.00	0.59	$ 2,065.00
35	SOD	SQ	$ 100.00	115	$ 11,500.00
36	PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL)	EA	$ 28.00	826	$ 23,128.00
37	PLANTS WITH WARRANTY, DECIDUOUS TREE	EA	$ 750.00	7	$ 5,250.00
38	SWPPP PREPARATION	LS	$ 5,000.00	1	$ 5,000.00
39	SWPPP MANAGEMENT	LS	$ 5,000.00	1	$ 5,000.00
40	FILTER SOCK/WATTLE	LF	$ 4.00	1150	$ 4,600.00
41	RIP RAP, CLASS E	TON	$ 60.00	20	$ 1,200.00
42	SILT FENCE OR SILT FENCE DITCH CHECK	LF	$ 4.00	200	$ 800.00
43	INLET PROTECTION DEVICE	EA	$ 150.00	1	$ 150.00
44	END OF SEASON TEMPORARY EROSION CONTROL	AC	$ 1,500.00	1	$ 1,500.00
45	DEMOLITION WORK - EXISTING RESTROOMS	LS	$ 2,500.00	1	$ 2,500.00
46	MOBILIZATION	LS	$ 135,000.00	1	$ 135,000.00
47	CONCRETE WASHOUT	LS	$ 5,000.00	1	$ 5,000.00
48	FREESTANDING RINSE STATION	LS	$ 20,000.00	1	$ 20,000.00
49	RESTROOM	LS	$ 300,000.00	1	$ 300,000.00
50	BENCH TYPE 1 (CURVED BENCH, SINGLED SIDED)	EA	$ 6,700.00	3	$ 20,100.00
51	BENCH TYPE 2 (CURVED BENCH, DOUBLE SIDED)	EA	$ 30,000.00	1	$ 30,000.00
52	BENCH TYPE 3 (METAL BACKED BENCH)	EA	$ 4,300.00	5	$ 21,500.00
53	LITTER RECEPTACLE	EA	$ 2,770.00	2	$ 5,540.00
54	CONCRETE PEBBLE	EA	$ 1,400.00	3	$ 4,200.00
55	DECORATIVE METAL PANEL	LF	$ 400.00	155	$ 62,000.00
56	DECORATIVE ACRYLIC PANEL ATTACHMENT	LS	$ 25,000.00	1	$ 25,000.00
57	SIGN TYPE 1 (PARK SIGN)	LS	$ 15,000.00	2	$ 30,000.00
58	SIGN TYPE 2 (DONOR SIGN)	LS	$ 12,000.00	1	$ 12,000.00
59	SIGN TYPE 3 (DONOR STORY SIGN)	LS	$ 12,000.00	1	$ 12,000.00
60	BIKE RACK	EA	$ 1,500.00	6	$ 9,000.00
61	WATER FEATURE AND TREATMENT SYSTEM	LS	$ 606,000.00	1	$ 606,000.00
62	SCULPTURE FOOTING	LS	$ 10,000.00	1	$ 10,000.00
63	ELECTRICAL CONDUIT/WIRING	LS	$ 190,000.00	1	$ 190,000.00
					$ 2,194,854.00

SECTION 00100 - NOTICE TO BIDDERS

Water Plaza at Mega-10 Park
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 November 20, 2024, 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 November 25, 2024, 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 November 15, 2025. Liquidated damages are as set forth in 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 401 E Grand Ave, Suite 101, Des Moines, IA 50309. 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 #9319208 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: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that generally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid items include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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

_____

Alicia Hunter
Clerk

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SECTION 00110 - NOTICE OF PUBLIC HEARING

Water Plaza at Mega-10 Park
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 November 11, 2024, at 24 N. Center Street, Marshalltown, Iowa 50158.

PROJECT DESCRIPTION: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that generally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid items include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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.

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CITY OF MARSHALLTOWN

CONSTRUCTION PLANS FOR

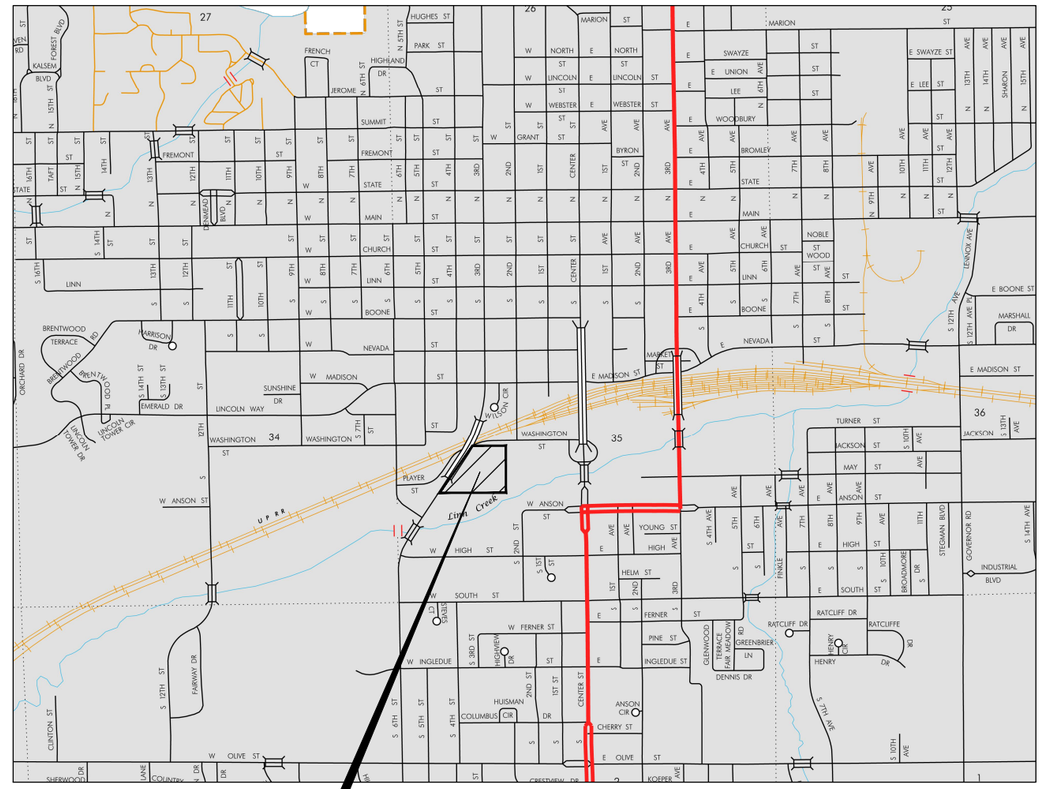
WATER PLAZA AT MEGA - 10 PARK

CITY PROJECT NUMBER: PRK22-004

SEPTEMBER 2024

NOTE: THIS SET IS INTENDED TO BE PRINTED IN COLOR. IF PRINTING IN BLACK AND WHITE, SOME LEGIBILITY MAY BE REDUCED.

Sheet List Table	
Sheet Number	Sheet Title
A.01	TITLE SHEET
A.02	LEGEND
B.01 - B.09	DETAILS
C.01	GENERAL NOTES
C.02	QUANTITIES
C.03-C.05	ESTIMATE REFERENCE NOTES
CE.01	EROSION CONTROL
D.01-D.08	DIMENSION PLAN
E.01 - E.03	GRADING
F.01	EXISTING CONDITIONS + REMOVALS
J.01	STAGING PLAN
K.01 - K.02	LANDSCAPING PLAN
M.01 - M.05	UTILITIES
M.06	UTILITY - LIFT STATION
P.00-P.02	ELECTRICAL PLAN
P.03-P.04	ELECTRICAL DETAILS
S.01-S.02	STRUCTURAL NOTES & DETAILS



PROJECT LOCATION

MAP OF THE
CITY OF MARSHALLTOWN
MARSHALL COUNTY, IA

GOVERNING SPECIFICATIONS

2024 EDITION OF THE "IOWA STATEWIDE URBAN SPECIFICATIONS FOR PUBLIC IMPROVEMENTS" (SUDAS) STANDARD SPECIFICATIONS AND THE CITY OF MARSHALLTOWN SUPPLEMENTAL SPECIFICATIONS

IOWA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION", VERSION OCTOBER 2015 AND ALL CURRENT GENERAL SUPPLEMENTAL SPECIFICATIONS AND MATERIALS INSTRUCTIONAL MEMORANDUM SHALL GOVERN AS REFERENCED.

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

MUTCD 2023 AS ADOPTED BY IOWA DEPARTMENT OF TRANSPORTATION.

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811

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

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY 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."

PROJECT DATUM

IOWA REGIONAL COORDINATE SYSTEM REGION 9 (IARCS-9)

LICENSED PROFESSIONAL ENGINEER JASON GRAHAM P22668 IOWA

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.

JASON GRAHAM

REG. NO. P22668 DATE: 9/27/2024

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2024

PAGES OR SHEETS COVERED BY THIS SEAL:

ALL S SHEETS

LICENSED PROFESSIONAL ENGINEER KATHRYN E. STERK 24399 IOWA

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.

KATHRYN E. STERK, P.E.

REG. NO. 24399 DATE: 09/27/2024

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2024

PAGES OR SHEETS COVERED BY THIS SEAL:

B.09, M.06

LICENSED PROFESSIONAL ENGINEER JEFF A. BARTLEY 16586 IOWA

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.

JEFF A. BARTLEY

LICENSE NUMBER: 16586 DATE: 09/27/2024

MY LICENSE RENEWAL DATE IS RENEW DECEMBER 31, 2024

PAGES OR SHEETS COVERED BY THIS SEAL:

D.02-D.08

LICENSED PROFESSIONAL ENGINEER RICHARD K. LARSON 16014 IOWA

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 09/27/2024 Date

Richard K. Larson

License number 16014

My license renewal date is December 31, 2025.

Pages or sheets covered by this seal: P.00-P.01, P.03-P.04

PROFESSIONAL LANDSCAPE ARCHITECT NATE W. WEITL 00677 IOWA

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.

NATE M. WEITL

LICENSE NUMBER: 00677 DATE: 09/27/2024

MY LICENSE RENEWAL DATE IS JUNE 2025

PAGES OR SHEETS COVERED BY THIS SEAL:

A.01-A.02, B.01-B.03, B.05-B.08, C.01-C.05, D.01, F.01, J.01, K SHEETS, P.02

LICENSED PROFESSIONAL ENGINEER GREGORY A. BROUSSARD 21974 IOWA

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.

GREGORY A. BROUSSARD, P.E.

REG. NO. 21974 DATE: 09/27/2024

MY LICENSE RENEWAL DATE IS DECEMBER 31, 2025

PAGES OR SHEETS COVERED BY THIS SEAL:

B.04, C.01-C.05, CE.01, E SHEETS, M.01-M.05

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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

TITLE SHEET

SHEET A.01

EXISTING TOPOGRAPHIC SYMBOLS

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

PROPOSED TOPOGRAPHIC SYMBOLS

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

SURVEY SYMBOLS

- BENCH MARK LOCATION
- CONTROL POINT
- MONUMENT IRON FOUND
- CAST IRON MONUMENT

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

GRADING INFORMATION

952
950
952
950
× 953.53
× STA:5+67.19
980.87
1:4

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

EXISTING PRIVATE UTILITY LINES

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.

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

SECTION AND DETAIL IDENTIFICATION

SECTION IDENTIFICATION

SECTION CALL OUT AS SHOWN ON SHEETS:

SECTION NUMBER — 1 / D.1 — DRAWING ON WHICH SECTION APPEARS *

DETAIL IDENTIFICATION

DETAIL CALL OUT AS SHOWN ON SHEETS:

DETAIL NUMBER — 1 / D.1 — DRAWING ON WHICH DETAIL IS SHOWN *

* NOTE:
IF PLAN AND SECTION (OR DETAIL CALL-OUT AND DETAIL) ARE SHOWN ON THE SAME DRAWING, DRAWING NUMBER IS REPLACED BY A LINE.

ABBREVIATIONS

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

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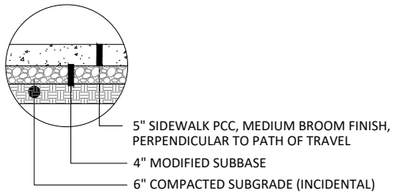
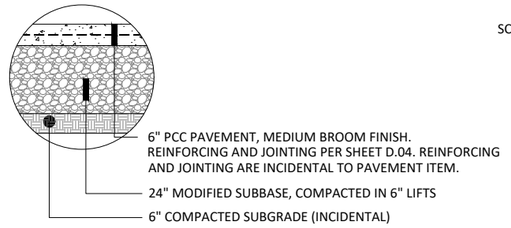
CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
LEGEND

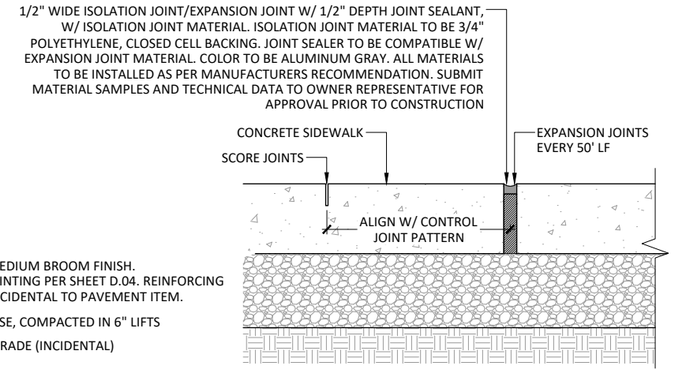
SHEET
A.02



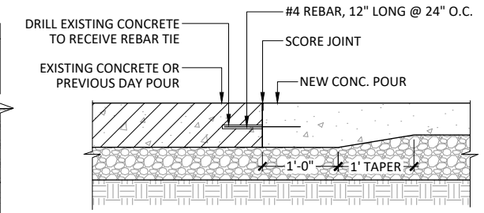
1 PAVEMENT, PCC, 5"
SCALE: N.T.S.



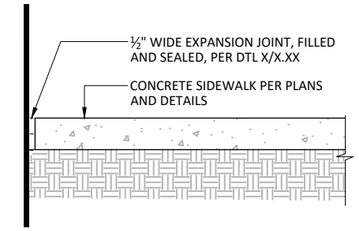
2 PAVEMENT, PCC, 6" REINFORCED
SCALE: N.T.S.



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



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

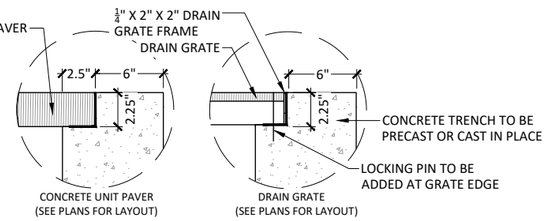


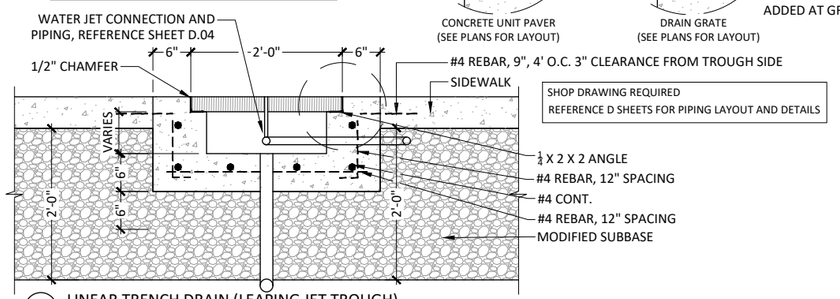
5 CONCRETE ISOLATION JOINT AT BUILDING EDGE
SCALE: N.T.S.

PRODUCT INFORMATION:

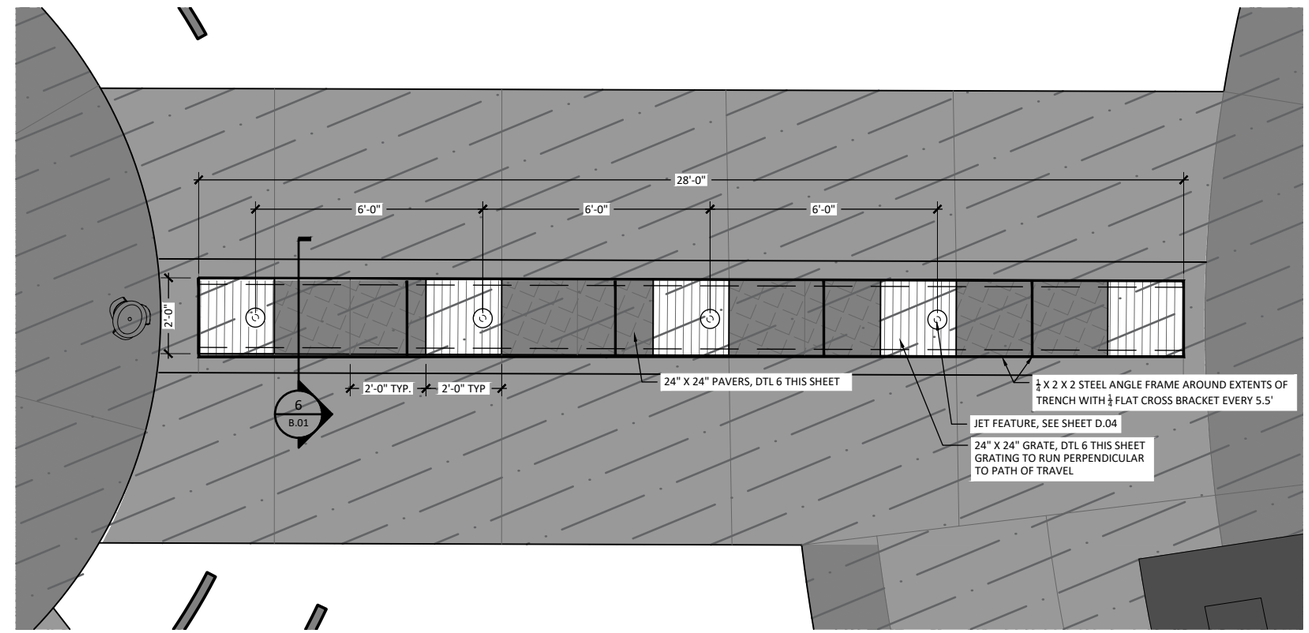
DRAIN GRATE:
Hendrick Architectural, Julie Jorgensen, 402-321-3563
Hendrick's Profile Bar, B12, Slop opening to be verified
Finish: sandblast

CONCRETE UNIT PAVER:
Unilock, TJ Weinandt, 402-630-3884
Skyline Concrete Unit Paver, 2' x 2'
Color: Light Gray
Finish: Classic thru-mix





6 LINEAR TRENCH DRAIN (LEAPING JET TROUGH)
SCALE: N.T.S.



8 PLAN ENLARGEMENT TYPICAL: LINEAR TRENCH DRAIN (LEAPING JET TROUGH)
SCALE: N.T.S.

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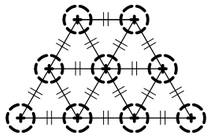
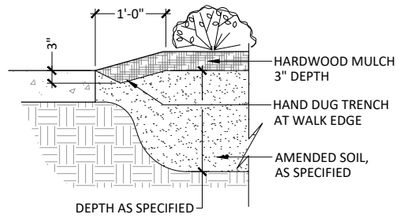
CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

SHEET
B.01

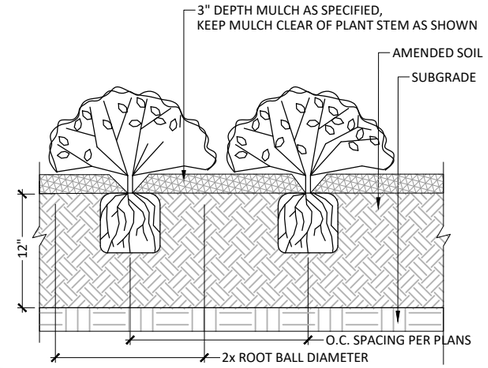


NOTES:
1. O.C. TRIANGULAR PLANT SPACING PER PLANS
2. AREAS IDENTIFIED ON PLANTING PLAN AS O.C. SHALL BE TRIANGULAR SPACED
3. SEE PLANTING PLAN/SCHEDULE FOR SPECIES

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

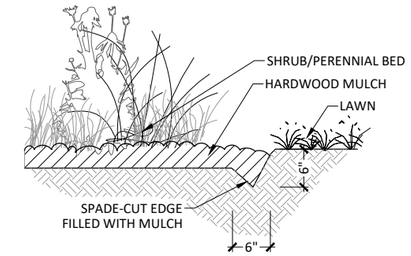


2 PLANTING EDGE AT PAVEMENT
SCALE: N.T.S.

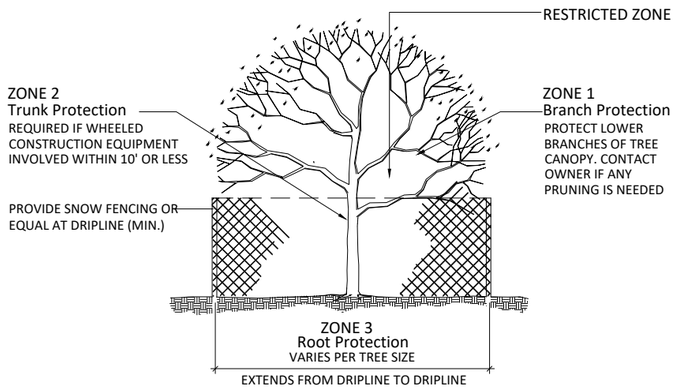


3 PERENNIAL PLANTING, TYP.
SCALE: N.T.S.

NOTES:
SPADE-CUT EDGE TO BE INCIDENTAL TO PLANT MATERIAL AND SHALL BE USED WHERE ALL LANDSCAPE BEDS MEET ADJACENT SEEDED OR LAWN AREAS.



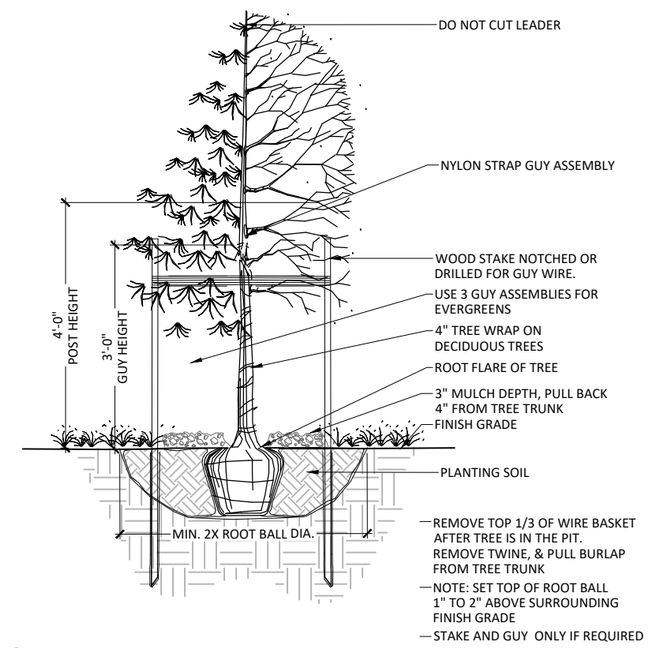
4 SPADE-CUT EDGE
SCALE: N.T.S.



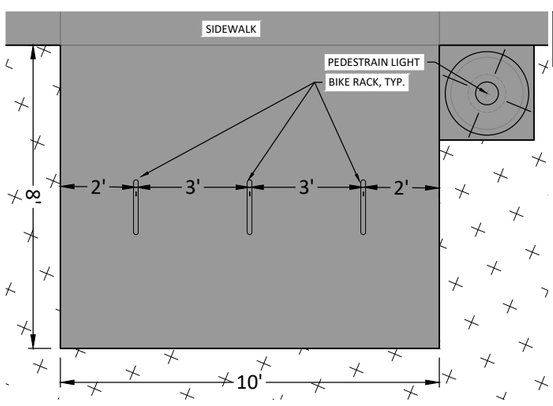
5 EXISTING TREE PROTECTION
N.T.S.

TREE PROTECTION NOTES

1. ALL TREES TO BE PROTECTED AND PRESERVED SHALL BE PER DETAIL. GROUPING OF MORE THAN ONE TREE MAY OCCUR.
2. TREES TO BE PROTECTED AND PRESERVED SHALL BE IDENTIFIED ON THE TRUNK WITH WHITE SURVEY TAPE.
3. 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.
4. TREE ROOTS SHALL NOT BE CUT UNLESS CUTTING IS UNAVOIDABLE.
5. 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.
6. 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.
7. WATERING OF PROTECTED TREES IN WHICH ROOTS WERE CUT SHALL BE PROVIDED BY THE CONTRACTOR.
8. AUGER TUNNELING RATHER THAN TRENCHING SHOULD BE USED FOR UTILITY PLACEMENT WITHIN DRIP LINE OF TREE.
9. FENCING MATERIAL SHALL ENCIRCLE ANY TREE WHOSE OUTER DRIP LINE EDGE IS WITHIN 20 FEET OF ANY CONSTRUCTION ACTIVITIES.
10. FENCING MATERIAL SHALL BE BRIGHT, CONTRASTING COLOR, DURABLE, AND A MINIMUM OF FOUR FEET IN HEIGHT.
11. 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.
12. 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.



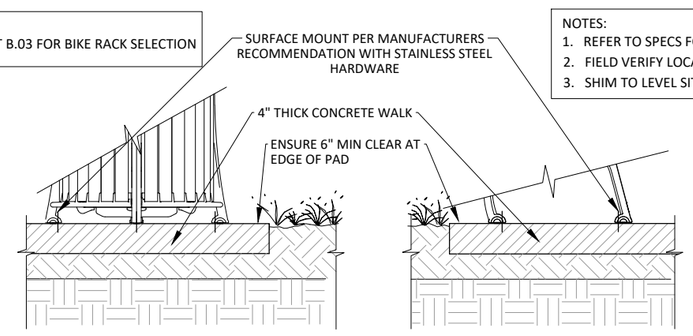
6 TREE PLANTING



7 PLAN ENLARGEMENT: BIKE RACK LAYOUT
SCALE: 1" = 2'-0"

NOTES:
SEE SHEET B.03 FOR BIKE RACK SELECTION

NOTES:
1. REFER TO SPECS FOR MODEL AND MANUFACTURERS
2. FIELD VERIFY LOCATION BY LANDSCAPE ARCHITECT
3. SHIM TO LEVEL SITE FURNISHINGS



8 SITE FURNISHINGS - MOUNTING DETAIL
SCALE: N.T.S.

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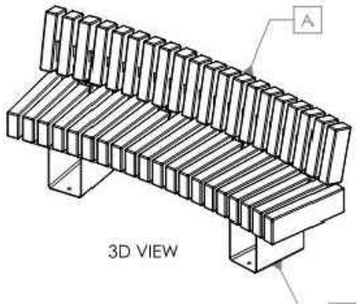
REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

SHEET
B.02



PRODUCT INFORMATION:

MANUFACTURER: STREETLIFE

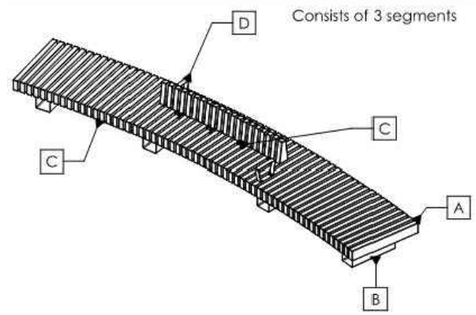
PRODUCT TYPE: ROUGH&READY CURVED BENCH WITH BACK

SEAT AND BACK REST: FSC HARDWOOD I - VIRGIN
LEGS: POWDER COAT STEEL - INTERPON EARTH
RADIUS: 18' RADIUS
LENGTH: 6' LENGTH
INSTALLATION: SURFACE MOUNT
INSTALL PER MANUFACTURERS STANDARD SPECIFICATIONS

CONTACT: SONNO WITJES
EMAIL: switjes@streetlife.com

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO ORDERING

1 BENCH TYPE 1



PRODUCT INFORMATION:

MANUFACTURER: STREETLIFE

PRODUCT TYPE: ROUGH&READY CURVED BENCH WITH BACK - DOUBLE SIDED

SEAT AND BACKREST: FSC HARDWOOD I - VIRGIN
LEGS: POWDER COAT STEEL - INTERPON EARTH
RADIUS: 38' RADIUS
LENGTH: 20' LENGTH

INSTALLATION: SURFACE MOUNT
INSTALL PER MANUFACTURERS STANDARD SPECIFICATIONS

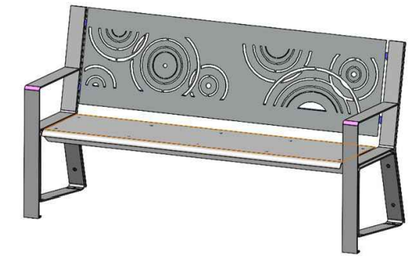
CONTACT: SONNO WITJES
EMAIL: switjes@streetlife.com

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO ORDERING

REFER TO PLANS FOR CUSTOM BENCH RADIUS FOR EACH CURVE BENCH

2 BENCH TYPE 2
SCALE: N.T.S.

IMAGE NOTE:
IMAGE FOR REFERENCE PURPOSES ONLY.
CUSTOM PATTERN TO BE PROVIDED.



PRODUCT INFORMATION:

MANUFACTURER: LANDSCAPE FORMS OR APPROVED EQUAL
PRODUCT TYPE: LAKESIDE BENCH
FINISH: POWDER COAT
COLOR: MATTE BLACK
INSTALLATION: SURFACE MOUNT
INSTALL PER MANUFACTURERS STANDARD SPECIFICATION

CONTACT: CONNOR LOCKWOOD
DIRECT: 319-431-2473
EMAIL: connorl@landscapeforms.com

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO ORDERING

CONTACT FOR CUSTOM PATTERN TO BE APPLIED TO ORDERING OF BENCH. PATTERN HAS ALREADY BEEN DRAWN AND DESIGNED.

3 BENCH TYPE 3
SCALE: N.T.S.

PRODUCT INFORMATION:

MANUFACTURER: WAUSAU TILE OR APPROVED EQUAL
CONTACT: JEFF GRAMLING
DIRECT: 715.359.5441
PRODUCT TYPE: SMALL TRIANGULAR CONCRETE BENCH
SIZE: ZB.GL.01
WEIGHT: 2,381LBS
FINISH: ACID WASH
COLOR: A26
INSTALLATION: INSTALL PER MANUFACTURER STANDARD SPECIFICATION
CONTACT: JEFF GRAMLING
DIRECT: 715.359.5441

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL BY OWNER PRIOR TO ORDERING

REFER TO PLANS FOR CUSTOM RADIUS FOR EACH CURVE BENCH

4 CONCRETE PEBBLE
SCALE: N.T.S.

PRODUCT INFORMATION:

MANUFACTURER: LANDSCAPE FORMS OR APPROVED EQUAL
PRODUCT TYPE: LAKESIDE LITTER RECEPTACLE
OPENING: SIDE OPENING
FINISH: POWDER COAT
COLOR: MATTE BLACK
INSTALLATION: SURFACE MOUNT
INSTALL PER MANUFACTURERS STANDARD SPECIFICATION

CONTACT: CONNOR LOCKWOOD
DIRECT: 319-431-2473
EMAIL: connorl@landscapeforms.com

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL BY OWNER PRIOR TO ORDERING

CONTACT FOR CUSTOM PATTERN TO BE APPLIED TO ORDERING OF LITTER RECEPTACLE. PATTERN HAS ALREADY BEEN DRAWN AND DESIGNED.

5 LITTER RECEPTACLE
SCALE: N.T.S.

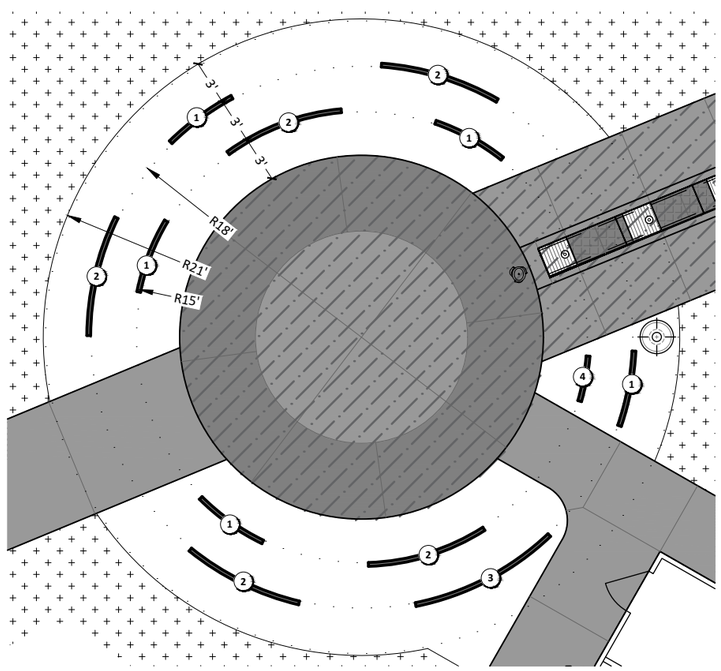
PRODUCT INFORMATION:

MANUFACTURER: LANDSCAPE FORMS OR APPROVED EQUAL
PRODUCT TYPE: LOOP BIKE RACK
FINISH: POWDER COATED
COLOR: MATTE BLACK
INSTALLATION: SURFACE MOUNT
INSTALL PER MANUFACTURERS STANDARD SPECIFICATIONS

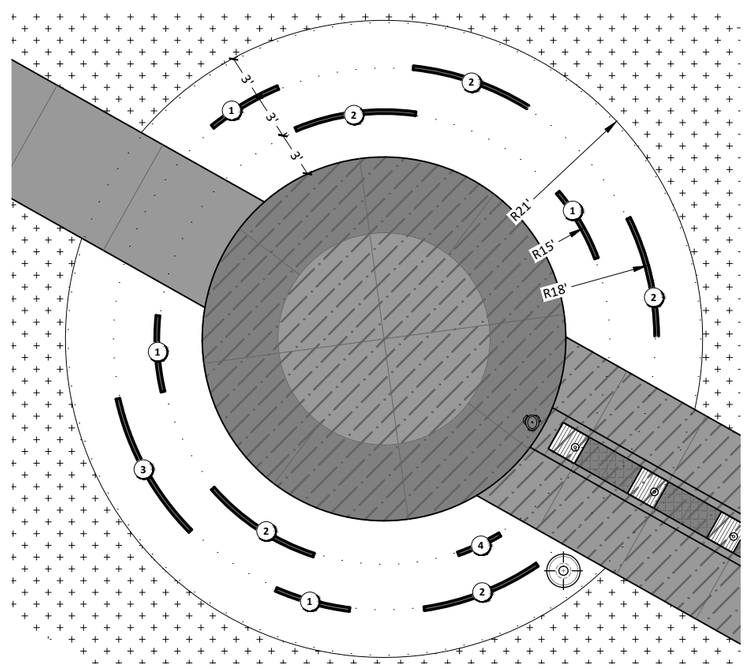
CONTACT: CONNOR LOCKWOOD
DIRECT: 319-431-2473
EMAIL: connorl@landscapeforms.com

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL BY OWNER PRIOR TO ORDERING

6 BIKE RACK
SCALE: N.T.S.



7 PLAN ENLARGEMENT: SOUTH-WEST DECORATIVE PANEL WALL LAYOUT
SCALE: N.T.S.



8 PLAN ENLARGEMENT: NORTH-WEST DECORATIVE PANEL WALL LAYOUT
SCALE: N.T.S.

METAL PANEL KEYNOTES				
KEY	DESCRIPTION	0' R	15' R	18' R
1	5'-0" DECORATIVE METAL PANEL, SEE SHEET B.06	0	5	4
2	8'-0" DECORATIVE METAL PANEL WITH 7'-0" ACRYLIC PANEL ATTACHMENT, SEE SHEET B.05	0	4	6
3	10'-0" DECORATIVE METAL PANEL, SEE SHEET B.05	0	0	2
4	SIGN TYPE 2 & 3, SEE SHEET B.07	2	0	0

NOTE:
ALL METAL AND ACRYLIC PANELS TO BE PREFORMED AND CURVED TO SPECIFIC RADIUS. SEE SHEET TABLE ABOVE AND PLAN ENLARGEMENT FOR SPECIFIC RADIUS AND LENGTHS. SEE SHEET B.07 FOR NOTES ON MATERIAL FINISH, THICKNESS, AND COLOR SELECTION FOR METAL PANELS, ACRYLIC PANELS, ACRYLIC PLAQUES, AND BASE BRACKET.

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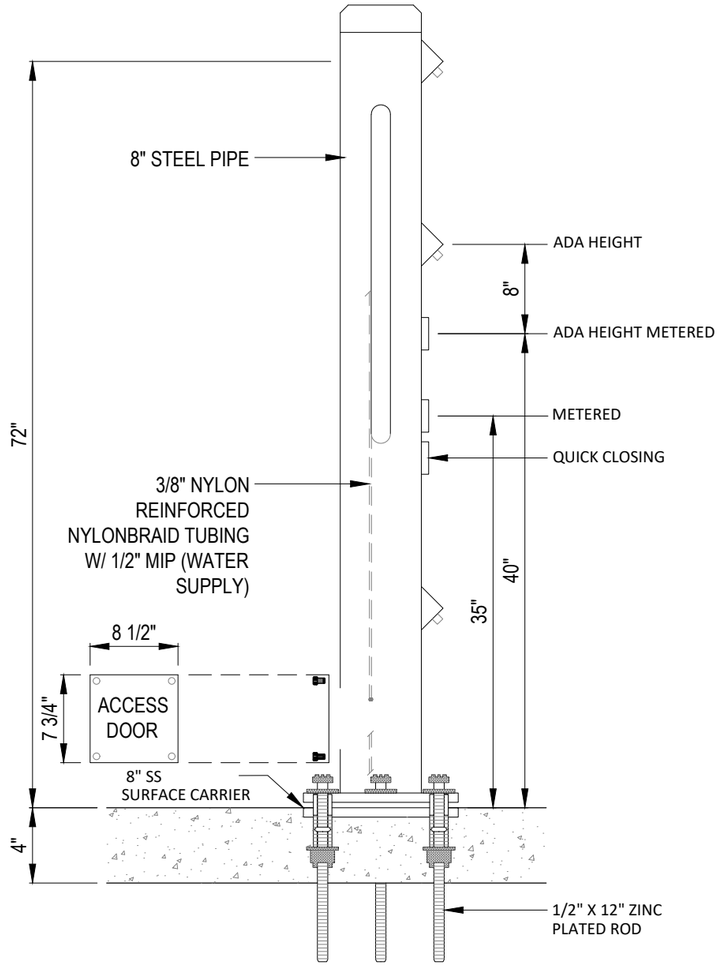
CHECKED	NW
BM PROJ. NO.	0T6.128279

REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

SHEET
B.03

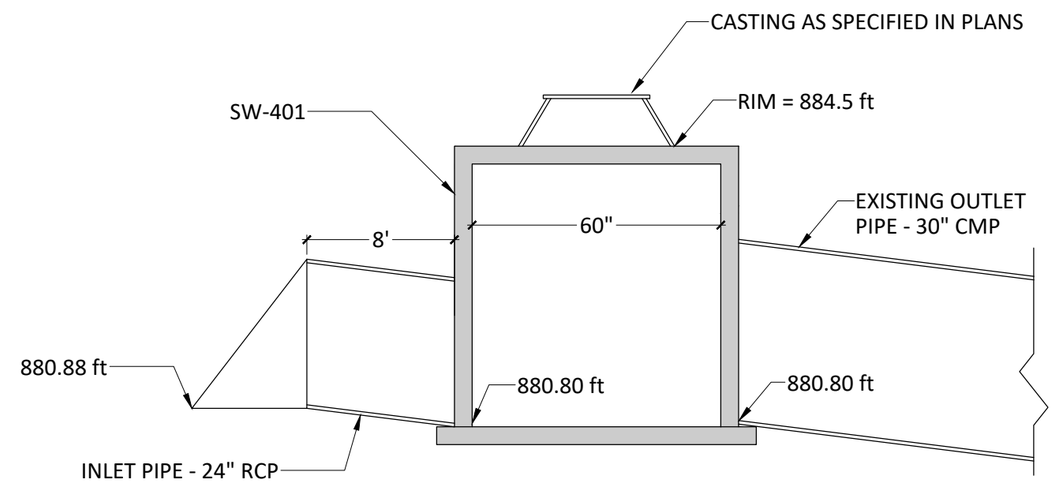


PRODUCT INFORMATION:
MANUFACTURER: MOST DEPENDABLE OR APPROVED EQUAL
PRODUCT TYPE: SHOWER 565 SMSS
COLOR: TEXTURED BLACK
INSTALL PER MANUFACTURERS STANDARD SPECIFICATION

CONTACT:
901-867-0039
info@mostdependable.com

CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR APPROVAL BY OWNER PRIOR TO ORDERING

NOTES:
1. STAINLESS STEEL SURFACE CARRIER RECOMMENDED ON SURFACE MOUNT INSTALLATIONS.
2. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. DO NOT SCALE DRAWING.
4. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
5. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
6. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 3354-10.5.
7. SEE SHEET M.04 FOR LOCATION



1 FREESTANDING RINSE STATION
SCALE: N.T.S.

2 OUTLET CONTROL STRUCTURE DETAIL
SCALE: N.T.S.

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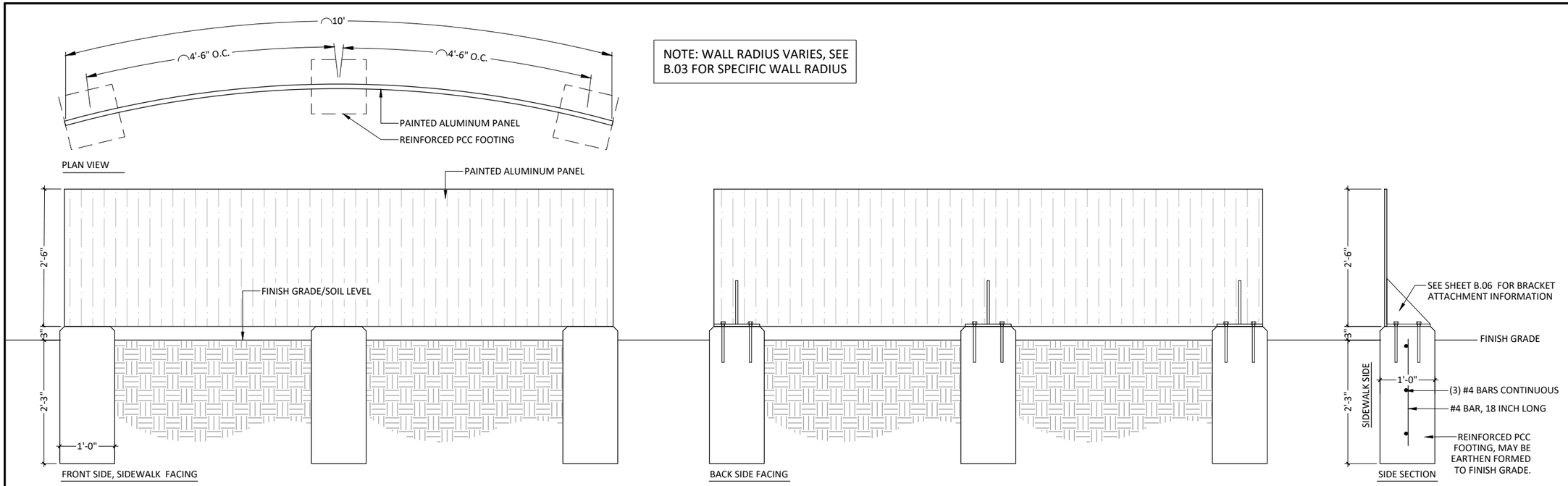
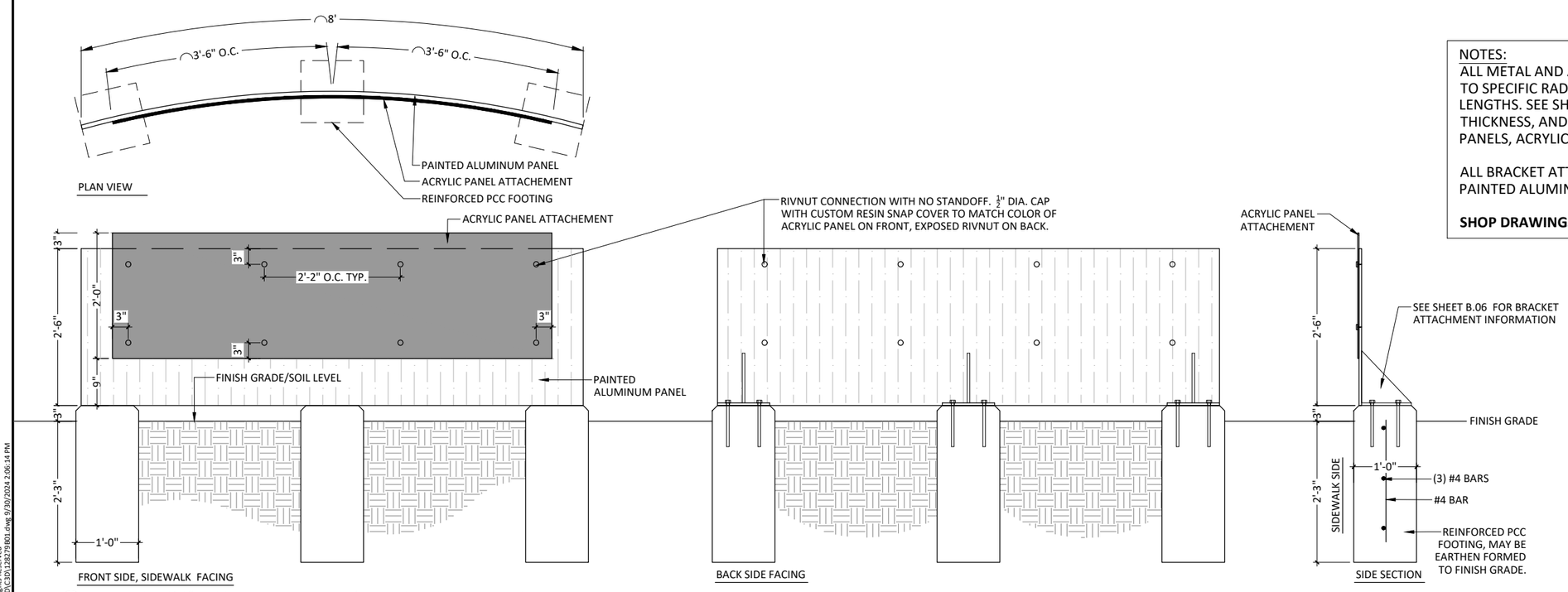
CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

SHEET
B.04

NOTE: WALL RADIUS VARIES, SEE B.03 FOR SPECIFIC WALL RADIUS



1 ELEVATION: 10'-0" DECORATIVE PANEL WALL
SCALE: N.T.S.



2 ELEVATION: 8'-0" DECORATIVE PANEL WALL (WITH ACRYLIC PANEL ATTACHMENT
SCALE: N.T.S.

NOTES:
ALL METAL AND ACRYLIC PANELS TO BE PREFORMED AND CURVED TO SPECIFIC RADIUS. SEE SHEET B.03 FOR SPECIFIC RADII AND LENGTHS. SEE SHEET B.06 FOR NOTES ON MATERIAL FINISH, THICKNESS, AND COLOR SELECTION FOR METAL PANELS, ACRYLIC PANELS, ACRYLIC PLAQUES, AND BASE BRACKETS.

ALL BRACKET ATTACHMENTS AND HARDWARE TO MATCH PAINTED ALUMINUM OF METAL PANEL

SHOP DRAWINGS REQUIRED FOR ALL DECORATIVE PANEL WALLS

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CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

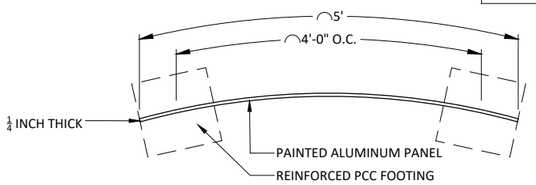
SHEET
B.05

NOTE: WALL RADIUS VARIES, SEE B.03 FOR SPECIFIC WALL RADIUS

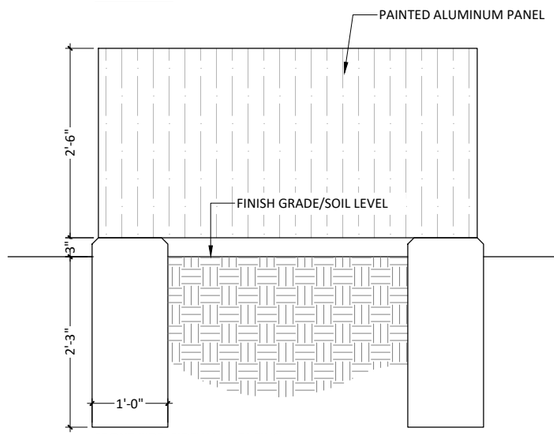
NOTES:
ALL METAL AND ACRYLIC PANELS TO BE PREFORMED AND CURVED TO SPECIFIC RADIUS. SEE SHEET B.03 FOR SPECIFIC RADII AND LENGTHS. SEE SHEET B.06 FOR NOTES ON MATERIAL FINISH, THICKNESS, AND COLOR SELECTION FOR METAL PANELS, ACRYLIC PANELS, ACRYLIC PLAQUES, AND BASE BRACKETS.

ALL BRACKET ATTACHMENTS AND HARDWARE TO MATCH PAINTED ALUMINUM OF METAL PANEL

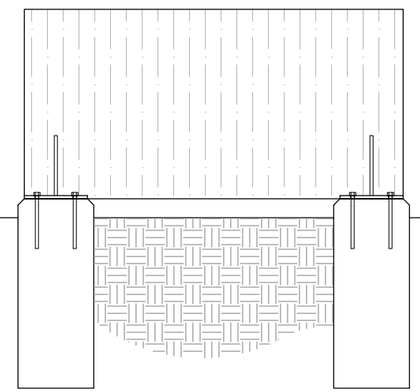
SHOP DRAWINGS REQUIRED FOR ALL DECORATIVE PANEL WALLS



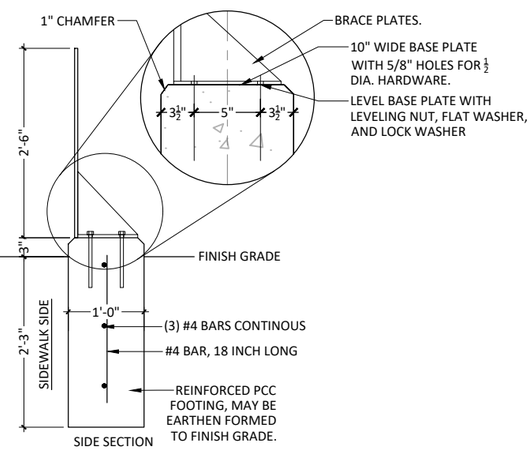
PLAN VIEW



FRONT SIDE, SIDEWALK FACING



BACK SIDE FACING



SIDE SECTION

SIDE SECTION

3 ELEVATION: 5'-0" DECORATIVE PANEL WALL
SCALE: N.T.S.

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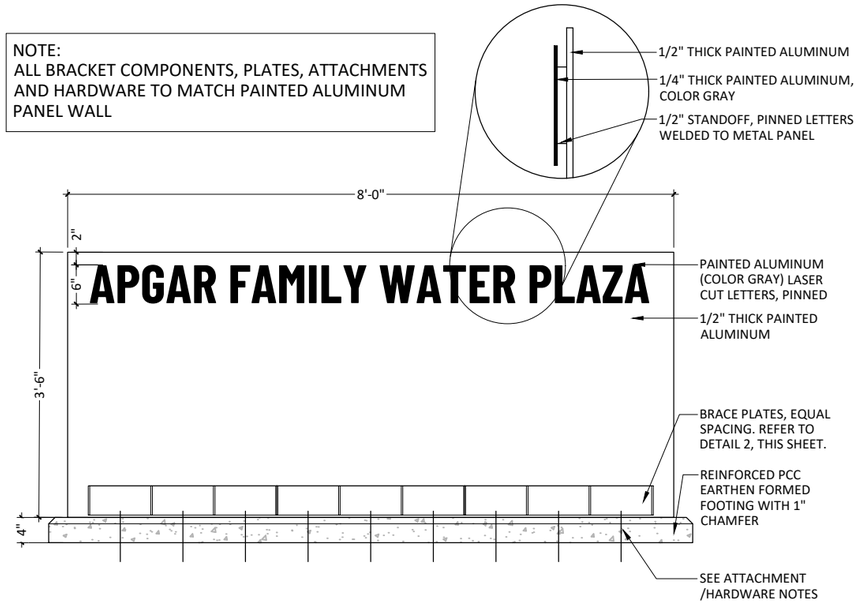
CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

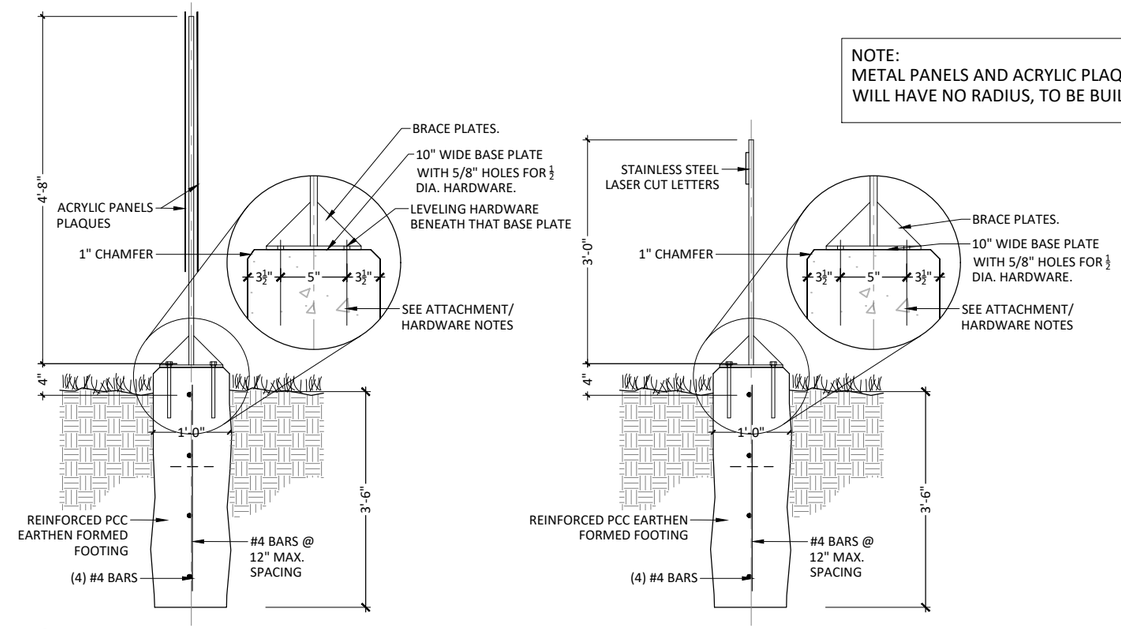
SHEET
B.06

NOTE:
ALL BRACKET COMPONENTS, PLATES, ATTACHMENTS AND HARDWARE TO MATCH PAINTED ALUMINUM PANEL WALL



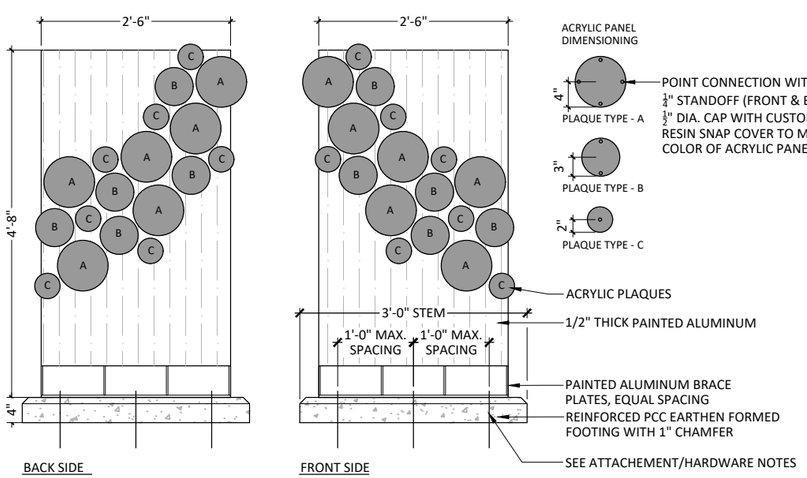
1 ELEVATION: SIGN TYPE 1
SCALE: N.T.S.

NOTE:
METAL PANELS AND ACRYLIC PLAQUES FOR SIGN TYPES 1-3 WILL HAVE NO RADIUS, TO BE BUILT STRAIGHT.

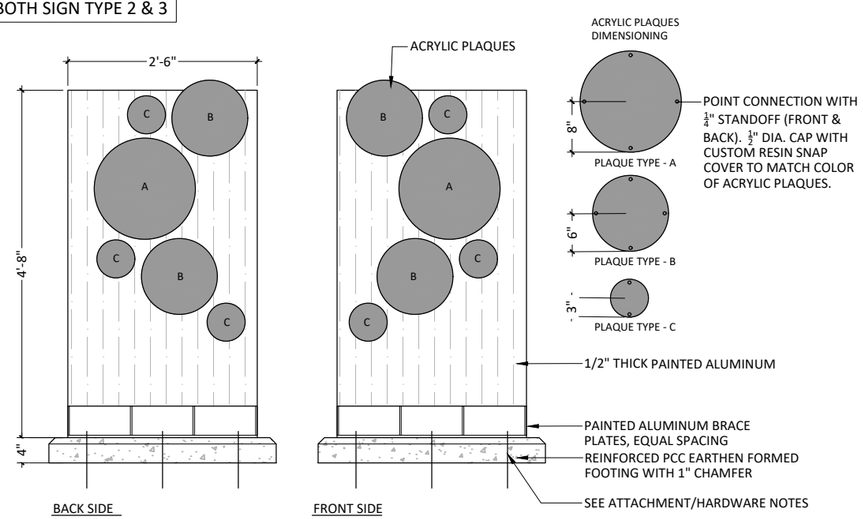


2 SECTION: SIGN TYPE 1, 2, & 3
SCALE: N.T.S.

NOTE: SHOP DRAWINGS REQUIRED
DIGITAL TEXT TO BE PROVIDED BY OWNER AND PRINTED INTO ACRYLIC PLAQUES. TEXT NOTES UNDER ACRYLIC PANEL PLAQUES GENERAL NOTES.
TEXT TO BE APPLIED ONLY TO PANEL SIZES A & B ON BOTH SIGN TYPE 2 & 3



3 ELEVATION: SIGN TYPE 2
SCALE: N.T.S.



4 ELEVATION: SIGN TYPE 3
SCALE: N.T.S.

METAL PANEL GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR ALL ELEMENTS RELATED TO METAL SIGN TYPE 1-3, INCLUDING METAL WORK, STRUCTURAL ELEMENTS, FABRICATION, FIT AND FINISH.
2. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS OF SITE CONFIGURATION PRIOR TO SHOP DRAWINGS AND FABRICATION. PANELS ON RADIUS TO BE PRE-SHAPED / CURBED TO THE SPECIFIED RADIUS IDENTIFIED ON SHEET (B.03) PRIOR TO ARRIVAL TO SITE.
3. SIZING FOR ALL WORK IS FOR AESTHETIC REFERENCE ONLY. STRUCTURAL INTEGRITY OF SIGN PANEL SYSTEM IS THE RESPONSIBILITY OF THE FABRICATOR. ADJUSTMENTS TO SIZES PER STRUCTURAL REQUIREMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IDENTIFIED IN THE SHOP DRAWINGS.
4. **CONTRACTOR TO PROVIDE PHYSICAL SAMPLES OF MANUFACTURER'S MATERIAL COLOR AND FINISH.**

ACRYLIC PANEL AND PLAQUES GENERAL NOTES:

1. INTEGRAL PANEL COLOR TO BE HYACINTH (B59), WITH PANEL INSERT COLOR AVALANCHE (D01)
2. TEXT INSET IN PANEL (DIGITAL) TO BE COLOR AVALANCHE (D01). TEXT FILES WITH FONT STYLE AND SIZE TO BE PROVIDED BY OWNER.
3. MATERIAL POLYCARBONATE (KODA Xt 1/2", SANDSTONE)
4. PANELS WALL ATTACHMENT RADIUS TO BE PREFORMED AND HEAT TREATED AT WAREHOUSE, ACRYLIC PLAQUE HOLES TO BE PRE-DRILLED.

PRODUCT INFORMATION:

ACRYLIC PLAQUES:
CONTACT: KRISITINE ALLEN, 3-FORM
kristine.allen@3-form.com, or 402-350-0720
OR APPROVED EQUAL

PREFERRED SIGNAGE FABRICATOR:
CONTACT: TONY SQUIRE, LATITUDE SIGNAGE
tony.squire@LatitudeSignage.com
515-419-9008
OR APPROVED EQUAL

SIGN TYPE 1, 2, & 3 ATTACHMENT/HARDWARE NOTES:

A. FINAL SIGN PANEL AND BASE PLATE DESIGN SHALL BE BY OTHERS. ANCHORAGES DETAILS ARE APPLICABLE ONLY IF USED IN THE CONFIGURATION SHOWN - ALTERNATE ANCHORAGE CONFIGURATION MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

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www.bolton-menk.com

DESIGNED	BH
DRAWN	BH/AC
CHECKED	NW
BMI PROJ. NO.	0T6.128279

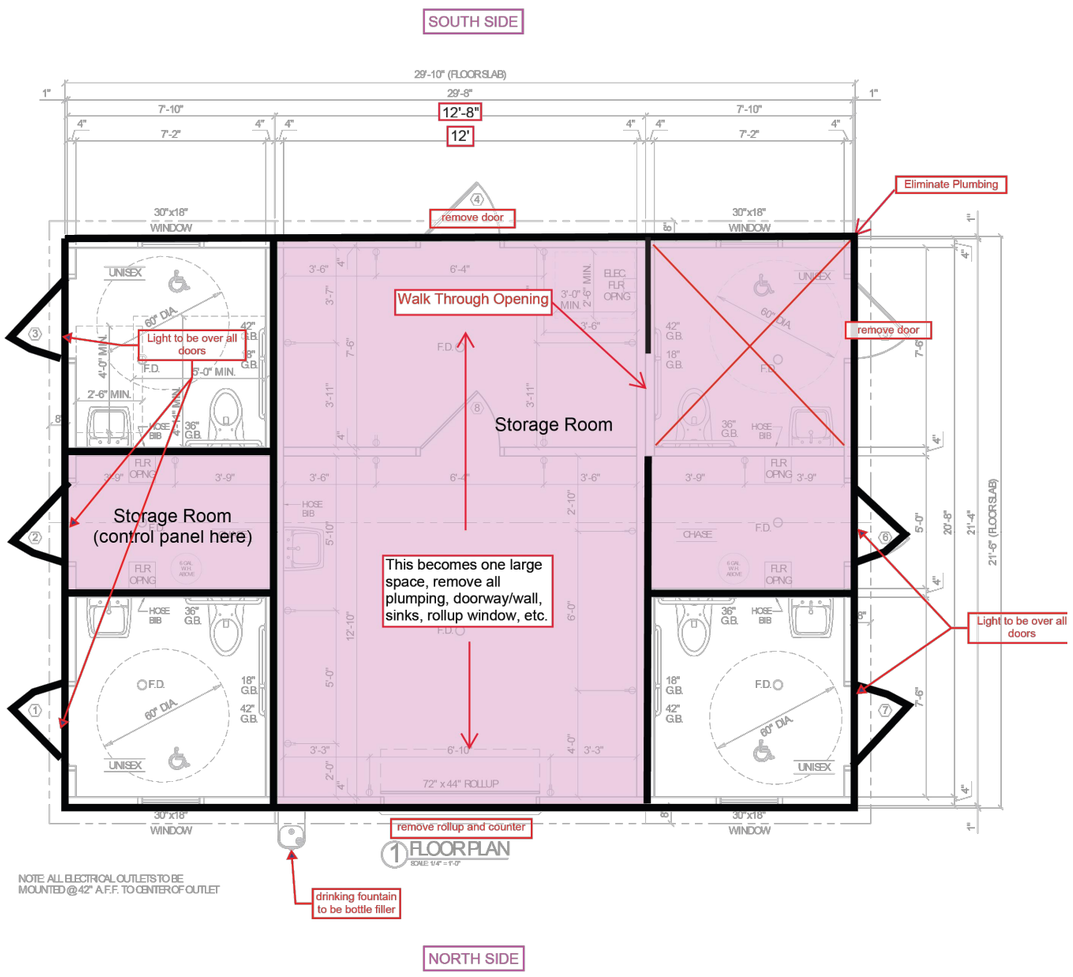
REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

SHEET
B.07

- MODULAR -

HICKORY



1 FLOOR PLAN
SCALE: 1/4" = 1'-0"

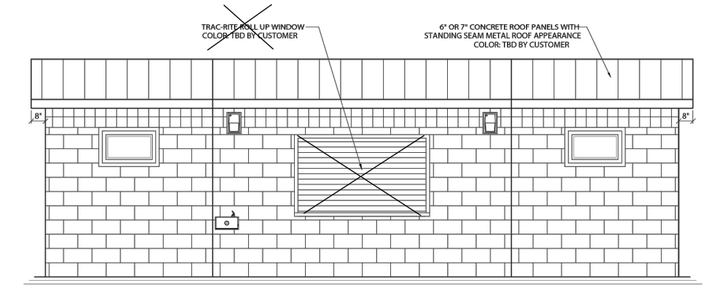
1 RESTROOM
SCALE: N.T.S.

NOTE:
MANUFACTURER TO BE HUFFCUTT OR APPROVED EQUAL.
CONTACT: REED SORENSEN,
reed.sorensen@huffcutt.com, 715-438-6245

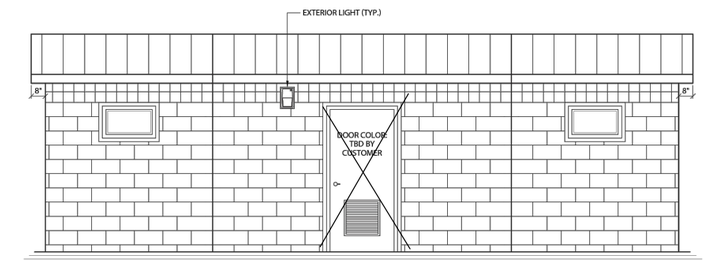
SHOP DRAWINGS REQUIRED. TO BE REVIEWED AND APPROVED BY LANDSCAPE ARCHITECT AND STRUCTURAL ENGINEER.

MODIFICATIONS TO BE MADE TO THE STANDARD HICKORY MODEL:

- BUILDING FOOTPRINT TO MATCH AS SHOWN IN PLANS
- REMOVAL OF TWO DOORS (SPECIFIED IN DRAWINGS)
- REMOVAL OF ROLLUP WINDOW AND COUNTER
- CREATE OPEN SPACE AS DISPLAYED BELOW, REMOVE DOOR, WALLS IDENTIFIED, SINKS, PLUMBING, TOILET, AND ALL OTHER NECESSARY ITEMS.
- WALL MOUNTED DRINKING FOUNTAIN TO HAVE BOTTLE FILLER
- EXTERIOR LIGHTS TO BE ABOVE ALL DOORS
- SECURITY CAMERA (4), CONDUIT AND ELECTRICAL TO BE INSTALLED. LOCATION TO BE DETERMINED BY OWNER.

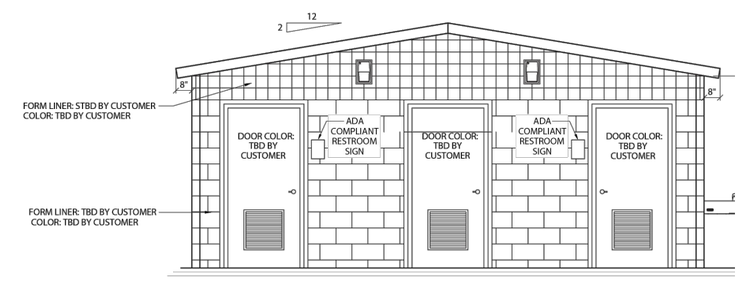


1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

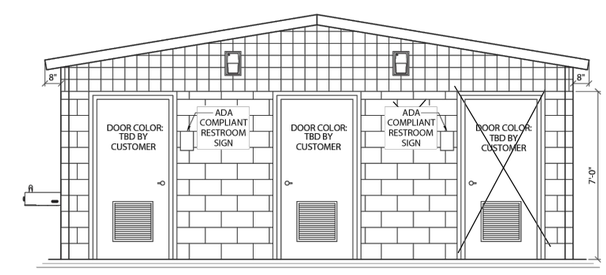


2 REAR ELEVATION
SCALE: 1/4" = 1'-0"

2 RESTROOM
SCALE: N.T.S.



1 LEFT ELEVATION
SCALE: 1/4" = 1'-0"



3 RESTROOM
SCALE: N.T.S.

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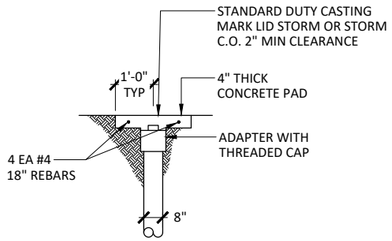
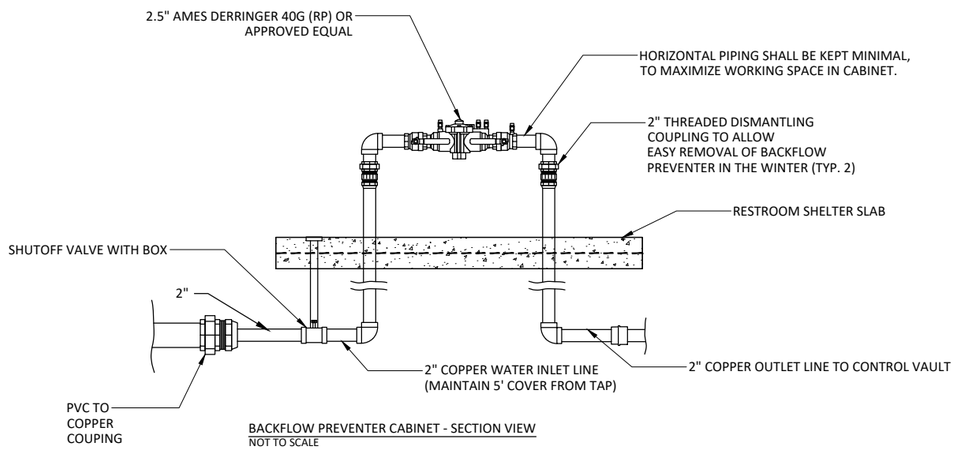
REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

SHEET
B.08



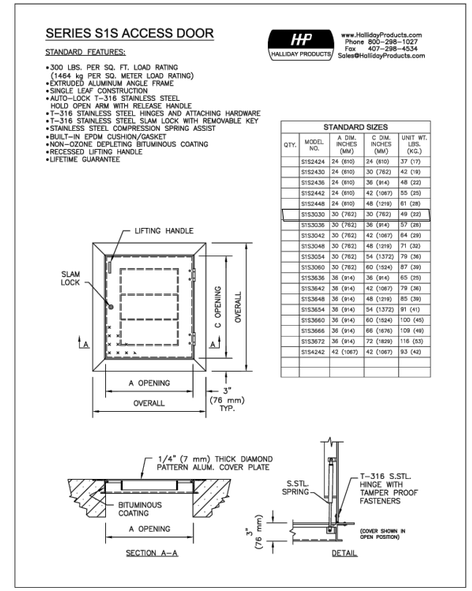
1 CLEANOUT
SCALE: N.T.S.



BACKFLOW PREVENTER CABINET - SECTION VIEW
NOT TO SCALE

BACKFLOW PREVENTER AND VAULT NOTES:
1. DETAILS SHOWN ON THIS SHEET ARE TO BE USED FOR GENERAL CONCEPTUAL LAYOUT AND TO IDENTIFY THE MINIMUM REQUIREMENTS WHICH ARE TO BE MET. THESE DETAILS MAY NOT IDENTIFY ALL COUPLINGS, FITTINGS, CONNECTIONS, OR OTHER ITEMS NECESSARY FOR SYSTEM. CONTRACTOR TO COORDINATE LAYOUT, ORDERING, CONSTRUCTION, AND INSTALLATION OF ITEMS WITH VAULT MANUFACTURER, SPLASH PAD EQUIPMENT MANUFACTURER, AND CABINET MANUFACTURER. VAULT SHALL ALSO HOUSE A PRESSURE REGULATOR.
2. THE SPLASH PAD CONTROL VAULT SHOULD BE SUPPLIED BY AQUATIX, INC. THE VAULT SHOULD BE DELIVERED TO CONTRACTOR/SITE FULLY ASSEMBLED BY AQUATIX, ALLOWING FOR CONTRACTOR TO INSTALL ALL EXTERIOR PIPING AND MAKE THE EXTERIOR CONNECTIONS ONCE DELIVERED TO SITE. AQUATIX REPRESENTATIVE SHALL BE ONSITE FOR INITIAL PRODUCT STARTUP, TO ENSURE ALL COMPONENTS ARE OPERATING PROPERLY AND THAT THE SPLASH PAD IS FULLY FUNCTIONAL.
3. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIERS TO ENSURE ALL DIMENSIONS AND COORDINATES ARE CORRECT FOR CONNECTIONS.
4. CONTRACTOR SHALL PROVIDE NECESSARY INITIAL TESTING/CERTIFICATION OF BACKFLOW PREVENTER ONCE IT IS INSTALLED.

2 BACKFLOW PREVENTER
SCALE: N.T.S.

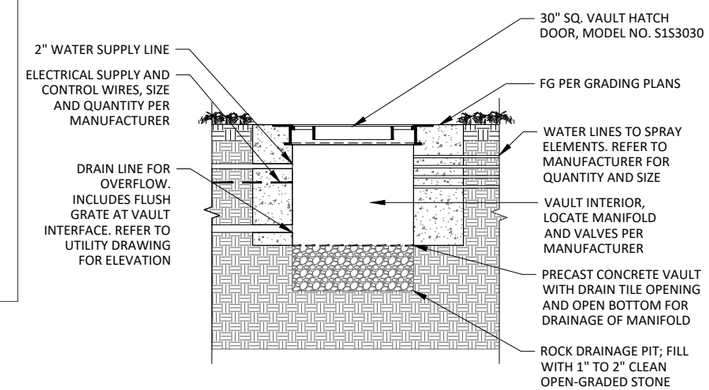


STANDARD SIZES

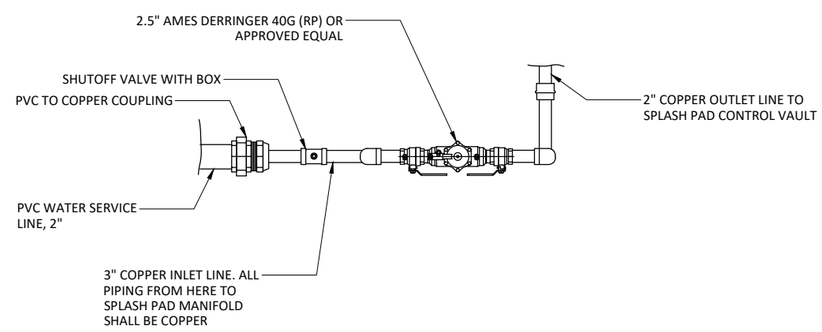
QTY.	MODEL NO.	A DIM. INCHES (MM)	C DIM. INCHES (MM)	UNIT WT. LBS. (KG.)
	S1S2424	24 (610)	24 (610)	37 (17)
	S1S2430	24 (610)	30 (762)	42 (19)
	S1S2436	24 (610)	36 (914)	48 (22)
	S1S2442	24 (610)	42 (1067)	55 (25)
	S1S2448	24 (610)	48 (1219)	61 (28)
	S1S3030	30 (762)	30 (762)	49 (22)
	S1S3036	30 (762)	36 (914)	57 (26)
	S1S3042	30 (762)	42 (1067)	64 (29)
	S1S3048	30 (762)	48 (1219)	71 (32)
	S1S3054	30 (762)	54 (1372)	79 (36)
	S1S3060	30 (762)	60 (1524)	87 (39)
	S1S3636	36 (914)	36 (914)	65 (29)
	S1S3642	36 (914)	42 (1067)	79 (36)
	S1S3648	36 (914)	48 (1219)	85 (39)
	S1S3654	36 (914)	54 (1372)	91 (41)
	S1S3660	36 (914)	60 (1524)	100 (45)
	S1S3666	36 (914)	66 (1676)	109 (49)
	S1S3672	36 (914)	72 (1829)	116 (53)
	S1S4242	42 (1067)	42 (1067)	93 (42)

SHOP DRAWINGS REQUIRED

NOTE:
CONTRACTOR TO COORDINATE VAULT SIZE AND UTILITY OPENINGS WITH WATER MANUFACTURER AS REQUIRED TO HOUSE THE MANIFOLD. THE UNDERGROUND VAULT MUST ACCOMMODATE WATER LINES, ELECTRICAL LINES, AND DRAINAGE SYSTEM REQUIRED TO WINTERIZE WATER PLAZA.



3 UNDERGROUND VAULT
SCALE: N.T.S.



BACKFLOW PREVENTER CABINET - PLAN VIEW
NOT TO SCALE

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REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
DETAILS

SHEET
B.09

STANDARD CONSTRUCTION NOTES:

1. ALL IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE IOWA STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS) AND SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES. THE CONTRACTOR SHALL HAVE A COMPLETE SET OF THE CURRENT SUDAS STANDARD SPECIFICATIONS ON SITE DURING ALL CONSTRUCTION ACTIVITIES.
2. ANY DEFECTIVE WORK CONDEMNED BY THE ENGINEER SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE IN ACCORDANCE WITH SECTION 1050, 1.08 'REMOVAL OF DEFECTIVE WORK' OF THE STANDARDS SPECIFICATIONS. FAILURE TO REMOVE DEFECTIVE WORK MAY RESULT IN SUSPENSION OF OPERATIONS AND/OR WITHHOLDING OF PAYMENTS UNTIL DEFECTIVE WORK HAS BEEN REMOVED AND REPLACED.
3. THE CONTRACTOR SHALL PRESERVE ALL SURVEY CONTROL, LINE AND GRADE STAKES IN ACCORDANCE WITH SECTION 1050, 1.10 'LINE AND GRADE STAKES' OF THE STANDARD SPECIFICATIONS.
4. PRIOR TO MOBILIZING OFF OF THE JOB SITE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO REQUEST A FINAL INSPECTION IN ACCORDANCE WITH SECTION 1050, 1.14 'FINAL INSPECTION AND ACCEPTANCE' OF THE STANDARD SPECIFICATIONS.
5. THE CONTRACTOR SHALL PROCURE ALL NECESSARY PERMITS AND LICENSES IN ACCORDANCE WITH SECTION 1070, 1.03 'PERMITS AND LICENSES' OF THE STANDARD SPECIFICATIONS.
6. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY AND COMPLYING WITH ALL CURRENT AND FUTURE FEDERAL AND STATE OSHA REQUIREMENTS IN ACCORDANCE WITH SECTION 1070, 2.02 'CONVENIENCE AND SAFETY' OF THE STANDARD SPECIFICATIONS.
7. LIMITS OF CONSTRUCTION ARE WITHIN THE CITY PROPERTY AND LEASED GROUND, UNLESS SHOWN OTHERWISE IN THE CONSTRUCTION DRAWINGS. WORK SHALL BE COMPLETED IN THE LIMITS OF CONSTRUCTION IN ACCORDANCE WITH SECTION 1070, 2.04 'PROJECT AREA FOR THE WORK' OF THE STANDARD SPECIFICATIONS.
8. IN ACCORDANCE WITH SECTION 1070, 2.08 'PROTECTION OF PROPERTY' OF THE STANDARD SPECIFICATIONS, THE CONTRACTOR SHALL CONTINUOUSLY MAINTAIN ADEQUATE PROTECTION OF ALL ITS WORK FROM DAMAGE AND SHALL PROTECT THE JURISDICTION'S PROPERTY AND ADJACENT PRIVATE PROPERTY FROM INJURY OR LOSS ARISING IN CONNECTION WITH THE WORK. THE CONTRACTOR SHALL REPAIR OR RESTORE ANY SUCH DAMAGE, INJURY, OR LOSS TO JURISDICTION PROPERTY OR ADJACENT PROPERTY. THE CONTRACTOR SHALL PROTECT TREES AND OTHER PROPERTY NOT MARKED FOR REMOVAL. THE CONTRACTOR SHALL SALVAGE ANY LANDSCAPING WITHIN THE RIGHT OF WAY UPON REQUEST BY THE ADJACENT PROPERTY OWNERS.
9. THE CONTRACTOR SHALL PRESERVE OR REPLACE ALL PROPERTY MONUMENTS ON THE PROJECT SITE IN ACCORDANCE WITH SECTION 1070, 2.09 'LAND MONUMENTS' OF THE STANDARD SPECIFICATIONS.
10. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SITE CLEANLINESS. UPON REQUEST BY THE ENGINEER, THE CONTRACTOR SHALL, AT ITS EXPENSE, CLEANUP AND REMOVE ALL REFUSE AND UNUSED MATERIALS OF ANY KIND RESULTING FROM THE WORK INCLUDING CLEANING AND SWEEPING OF ADJACENT STREETS. UPON FAILURE DO SO WITHIN THREE WORKING DAYS AFTER SUCH REQUEST BY THE ENGINEER, THE WORK MAY BE DONE BY THE JURISDICTION AND THE COST THEREOF CHARGED TO THE CONTRACTOR AND DEDUCTED FROM ITS FINAL PAYMENT IN ACCORDANCE WITH SECTION 1070, 2.15 'FINISHING AND CLEANUP REQUIREMENTS' OF THE STANDARD SPECIFICATIONS.
11. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A PROGRESS SCHEDULE THAT WILL ENSURE THE COMPLETION OF THE PROJECT WITHIN THE TIME SPECIFIED. IF IT APPEARS THE RATE OF PROGRESS IS SUCH THAT THE CONTRACT WILL NOT BE COMPLETED WITHIN THE TIME ALLOWED, OF IF THE WORK IS NOT BEING EXECUTED IN A SATISFACTORY AND WORKMANLIKE MANNER, THE ENGINEER MAY ORDER THE CONTRACTOR TO TAKE SUCH STEPS AS NECESSARY TO COMPLETE THE WORK AS SPECIFIED IN THE CONTRACT IN ACCORDANCE WITH SECTION 1080, 1.03 'WORK PROGRESS AND SCHEDULE' OF THE STANDARD SPECIFICATIONS.
12. IF PROJECT IS SUBSTANTIALLY COMPLETED AND ONLY CLEANUP AND MINOR WORK ITEMS REMAIN FOR MORE THAN 30 CALENDAR DAYS, THE ENGINEER MAY RESTART CHARGING OF WORKING DAYS OR CHARGE PENALTIES EQUAL TO THE CONTRACT LIQUIDATED DAMAGES UNTIL ALL CORRECTIVE ACTION HAS BEEN COMPLETED IN ACCORDANCE WITH SECTION 1080, 1.06 'WEEKLY RECORD OF WORKING DAYS' OF THE STANDARD SPECIFICATIONS.

UTILITY COORDINATION NOTES:

1. THE CONTRACTOR IS REQUIRED TO UTILIZE THE UTILITY ONE-CALL SERVICE AT (800) 292-8989 TO LOCATE EXISTING UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO EXCAVATING ANYWHERE ON THE PROJECT.
2. ANTICIPATED UTILITY CONFLICTS HAVE BEEN IDENTIFIED AND EACH RESPECTIVE UTILITY OWNER HAS BEEN INFORMED OF THE POTENTIAL CONFLICTS. THE CONTRACTOR SHALL PROTECT THE EXISTING UTILITIES TO REMAIN WITHIN THE PROJECT SITE.
3. THE LOCATION OF ALL AERIAL AND UNDERGROUND UTILITIES MAY NOT BE INDICATED ON THESE PLANS. WORK SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 1070, 2.07 'PROTECTION OF ABOVEGROUND AND UNDERGROUND FACILITIES' OF THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DAMAGE TO EXISTING UTILITIES.
4. IF A CONFLICT IS DISCOVERED BY THE CONTRACTOR, NOTIFY THE ENGINEER IMMEDIATELY AND COORDINATE WITH OWNER OF UTILITY TO RESOLVE CONFLICT.

PROJECT NOTES:

1. CONTRACTOR SHALL PROPERLY SECURE PROJECT SITE AT THE END OF EACH DAY.
2. CONTRACTOR OPERATIONS CREATING OBJECTIONABLE LEVELS OF NOISE SHALL NOT BEGIN PRIOR TO 7:00 AM AND SHALL END PRIOR TO 7:00 PM.
3. ALL DISTURBED AREAS SHALL BE SEEDED AND/OR MULCHED (DEPENDING ON DATE) UPON COMPLETION OF GRADING.
4. THE CONTRACTOR SHALL LIMIT THEIR ACCESS TO THE PROJECT SITE TO THE STABILIZED ENTRANCE LOCATIONS SHOWN IN THE SWPPP.
5. ANY TREES AND CROPS SHALL BE REMOVED ONLY BY APPROVAL OF THE ENGINEER.

STORM WATER POLLUTION PREVENTION PLAN NOTES:

1. CONTACTOR SHALL FOLLOW ALL REQUIREMENTS OF IDNR NPDES GENERAL PERMITS #2.
2. CONTACTOR SHALL MINIMIZE THE AMOUNT OF SOIL EXPOSED DURING CONSTRUCTION ACTIVITY
3. STABILIZATION OF DISTURBED AREAS MUST, AT A MINIMUM, BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING OR OTHER EARTH DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. IN DROUGHT-STRICKEN AREAS AND AREAS THAT HAVE RECENTLY RECEIVED SUCH HIGH AMOUNTS OF RAIN THAT SEEDING WITH FIELD EQUIPMENT IS IMPOSSIBLE AND INITIATING VEGETATIVE STABILIZATION IMMEDIATELY IS INFEASIBLE, ALTERNATIVE STABILIZATION MEASURES MUST BE EMPLOYED AS SPECIFIED BY THE DEPARTMENT. IN LIMITED CIRCUMSTANCES, STABILIZATION MAY NOT BE REQUIRED IF THE INTENDED FUNCTION OF A SPECIFIC AREA OF THE SITE NECESSITATES THAT IT REMAIN DISTURBED.
4. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE;
5. MINIMIZE THE EXPOSURE OF BUILDING MATERIALS, BUILDING PRODUCTS, CONSTRUCTION WASTES, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS PRESENT ON THE SITE TO PRECIPITATION AND STORM WATER. MINIMIZATION OF EXPOSURE IS NOT REQUIRED IN CASES WHERE THE EXPOSURE TO PRECIPITATION AND TO STORM WATER WILL NOT RESULT IN A DISCHARGE OF POLLUTANTS, OR WHERE EXPOSURE OF A SPECIFIC MATERIAL OR PRODUCT POSES LITTLE RISK OF STORM WATER CONTAMINATION (SUCH AS FINAL PRODUCTS AND MATERIALS INTENDED FOR OUTDOOR USE)
6. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM SPILLS AND LEAKS AND IMPLEMENT CHEMICAL SPILL AND LEAK PREVENTION AND RESPONSE PROCEDURES.
7. CONCRETE WASHOUTS SHALL BE PROVIDED ON SITE.
8. QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN STABILIZED WITH A PERENNIAL, VEGETATIVE COVER OF SUFFICIENT DENSITY TO PRECLUDE EROSION AT LEAST ONCE EVERY SEVEN CALENDAR DAYS. UNLESS EROSION IS EVIDENT OR OTHER CONDITIONS WARRANT THEM, REGULAR INSPECTIONS ARE NOT REQUIRED ON AREAS THAT HAVE BEEN STABILIZED WITH A PERENNIAL, VEGETATIVE COVER OF SUFFICIENT DENSITY TO PRECLUDE EROSION.
9. DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM.
10. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFFSITE SEDIMENT TRACKING.
11. BASED ON THE RESULTS OF THE INSPECTION, POLLUTION PREVENTION MEASURES IDENTIFIED IN THE PLANS SHALL BE REVISED AT THE CONSTRUCTION SITE AS APPROPRIATE AS SOON AS PRACTICABLE AFTER THE INSPECTION AND TO THE PLAN AS SOON AS PRACTICABLE AFTER THE INSPECTION BUT IN NO CASE MORE THAN 7 CALENDAR DAYS FOLLOWING THE INSPECTION. IF THE PERMITTEE DETERMINES THAT MAKING THESE CHANGES AT THE CONSTRUCTION SITE OR TO THE PLAN LESS THAN 72 HOURS AFTER THE INSPECTION IS IMPRACTICABLE, THE PERMITTEE SHALL DOCUMENT IN THE PLAN WHY IT IS IMPRACTICABLE AND INDICATE AN ESTIMATED DATE BY WHICH THE CHANGES WILL BE MADE.
12. A REPORT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN, AND ACTIONS TAKEN SHALL BE MADE AND RETAINED AS PART OF THE STORM WATER POLLUTION PREVENTION PLAN FOR AT LEAST THREE YEARS AFTER FINAL STABILIZATION HAS BEEN ACHIEVED AND A NOTICE OF DISCONTINUATION HAS BEEN SUBMITTED TO THE DEPARTMENT.

PAVING NOTES:

1. PAVING SHALL BE COMPLETED IN ACCORDANCE WITH DIVISION 7 OF THE SPECIFICATIONS.
2. THE CONTRACTOR SHALL SUBMIT INFORMATION TO THE ENGINEER FOR APPROVAL IN ACCORDANCE WITH SECTIONS 1050, 1.05 AND 7010, 1.03 OF THE STANDARD SPECIFICATIONS:
   a. PCC PAVING MIX DESIGN
   b. MATURITY CURVES FOR PAVING MIXES AND MATURITY READING RESULTS
3. PAVEMENT DESIGN SHALL INCLUDE A MINIMUM STRENGTH OF 4,000 PSI.
4. DROP CURBS SHALL BE CONSTRUCTED AT INTERSECTION FOR PEDESTRIAN RAMPS AND SHALL BE CONSIDERED INCIDENTAL TO PAVING.
5. PEDESTRIAN RAMPS SHALL INCLUDE "DETECTABLE WARNING" TEXTURE.
6. ALL UTILITY FIXTURES (WATER VALVE BOXES, MANHOLES, AND STORM SEWER INTAKES) SHALL BE SET TO THEIR CORRESPONDING PAVEMENT ELEVATIONS.

GRADING NOTES

1. ALL GRADING OPERATIONS SHALL BE COMPLETED IN ACCORDANCE WITH DIVISION 2 OF THE SPECIFICATIONS
2. THE PROPOSED CONTOURS ARE SHOWN ARE TO FINISH GROUND/TOP OF PAVEMENT
3. THE CONTRACTOR SHALL SHAPE GRADED AREAS TO MAINTAIN SURFACE DRAINAGE AT ALL TIMES.
4. THE CONTRACTOR SHALL BACKFILL CURBS AS SOON AS POSSIBLE UPON COMPLETION OF PAVING
5. DEWATERING (IF NECESSARY) IS CONTRACTOR'S RESPONSIBILITY AND SHALL BE CONSIDERED INCIDENTAL. CONTRACTOR SHALL MINIMIZE COMPACTION OF TOPSOIL TO THE EXTENT PRACTICABLE.

STORM SEWER NOTES

1. STORM SEWER INSTALLATION SHALL BE IN ACCORDANCE WITH DIVISIONS 3, 4, AND 6 OF THE SPECIFICATIONS.
2. STORM SEWER BEDDING SHALL BE CLASS R2.
3. THE CONTRACTOR SHALL REPAIR ANY FIELD TILE ENCOUNTERED DURING CONSTRUCTION OF THIS PROJECT (WHETHER SHOWN ON THE PLAN OR NOT) BY SPLICING OR CONNECTING THE TILE TO THE NEW STORM SEWER SYSTEM.

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DESIGNED BH	REV	DESCRIPTION	DATE
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CHECKED NW/GB			
BMI PROJ. NO. 0T6.128279			

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
GENERAL NOTES

SHEET C.01

ESTIMATED PROJECT QUANTITIES - BASE BID

ITEM NO.	ITEM CODE	ITEM	UNIT	QUANTITY	AS-BUILT QTY.
1	2010-C	CLEARING AND GRUBBING	LS	1	
2	2010-D-1	TOPSOIL, ON-SITE	CY	850	
3	2010-D-2	TOPSOIL, COMPOST AMENDED	CY	90	
4	2010-E	EXCAVATION, CLASS 10	CY	1960	
5	2010-J	SUBBASE, TEMPORARY GRANULAR MATERIAL	SY	1615	
6	2010-J	SUBBASE, MODIFIED, 4 INCHES	SY	520	
7	2010-J	SUBBASE, MODIFIED, 24 INCHES	SY	929	
8	2010-K-1	REMOVAL OF STRUCTURE, SANITARY LIFT STATION MANHJOLE	EA	1	
9	2010-M	COMPACTION TESTING	LS	1	
10	4010-E	SANITARY SEWER SERVICE	EA	2	
11	4020-A-1	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	305	
12	4020-A-1	STORM SEWER, TRENCHED, RCP, 24 INCH	LF	8	
13	4020-C	LINEAR TRENCH DRAIN (LEAPING JET TROUGH)	LS	2	
14	4030-B	PIPE APRON, RCP, 15 INCH	EA	1	
15	4030-B	PIPE APRON, RCP, 24 INCH	EA	1	
16	4040-A	SUBDRAIN, HDPE, 4 INCH	LF	220	
17	4040-C-1	SUBDRAIN CLEANOUT, 4 INCH	EA	2	
18	5010-E-1	WATER SERVICE PIPE, PVC, 2 INCH	LF	363	
19	5010-E-1	WATER SERVICE PIPE (TRENCHLESS), PVC, 2 INCH	LF	230	
20	5010-F	WATER SERVICE ABANDONMENT	EA	1	
21	5020-B	TAPPING VALVE ASSEMBLY, 2 INCH	EA	1	
22	6010-A	PACKAGE GRINDER LIFT STATION	EA	1	
23	6010-A	WATER MAIN MANHOLE, SW-401	EA	1	
24	6010-A	STORM SEWER OUTLET STRUCTURE	EA	1	
25	6010-A	STORM MANHOLE, SW-402	EA	1	
26	6010-X	SW-512, 18"	EA	1	
27	7010-A	PAVEMENT, PCC, 5 INCH	SY	370	
28	7010-A	PAVEMENT, PCC, 6 INCH REINFORCED (WET DECK)	SY	820	
29	7010-A	NON-SKID RUBBERIZED COATING	SF	3290	
30	7010-I	PCC PAVEMENT SAMPLES AND TESTING	LS	1	
31	7030-A-1	REMOVAL OF SIDEWALK	SY	135	
32	7040-A	FULL DEPTH PATCHES, PCC, 7 INCH	SY	23	
33	8030-A	TEMPORARY TRAFFIC CONTROL	LS	1	
34	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 1 - PERMANENT LAWN	AC	0.59	
35	9020-A	SOD	SQ	115	
36	9030-B	PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL)	EA	826	
37	9030-B	PLANTS WITH WARRANTY, DECIDUOUS TREE	EA	7	
38	9040-A-1	SWPPP PREPARATION	LS	1	
39	9040-A-2	SWPPP MANAGEMENT	LS	1	
40	9040-D-1	FILTER SOCK/WATTLE	LF	1150	
41	9040-J	RIP RAP, CLASS E	TON	20	
42	9040-N-1	SILT FENCE OR SILT FENCE DITCH CHECK	LF	200	
43	9040-T-1	INLET PROTECTION DEVICE	EA	1	
44	9040-V	END OF SEASON TEMPORARY EROSION CONTROL	AC	1	
45	10010-A	DEMOLITION WORK - EXISTING RESTROOMS	LS	1	
46	11020-A	MOBILIZATION	LS	1	
47	11050-A	CONCRETE WASHOUT	LS	1	
48	12010-X-X	FREESTANDING RINSE STATION	LS	1	
49	12010-X-X	RESTROOM	LS	1	
50	12010-X-X	BENCH TYPE 1 (CURVED BENCH, SINGLED SIDED)	EA	3	
51	12010-X-X	BENCH TYPE 2 (CURVED BENCH, DOUBLE SIDED)	EA	1	
52	12010-X-X	BENCH TYPE 3 (METAL BACKED BENCH)	EA	5	
53	12010-X-X	LITTER RECEPTACLE	EA	2	
54	12010-X-X	CONCRETE PEBBLE	EA	3	
55	12010-X-X	DECORATIVE METAL PANEL	LF	155	
56	12010-X-X	DECORATIVE ACRYLIC PANEL ATTACHMENT	LS	1	
57	12010-X-X	SIGN TYPE 1 (PARK SIGN)	LS	2	
58	12010-X-X	SIGN TYPE 2 (DONOR SIGN)	LS	1	
59	12010-X-X	SIGN TYPE 3 (DONOR STORY SIGN)	LS	1	
60	12010-X-X	BIKE RACK	EA	6	
61	12010-X-X	WATER FEATURE AND TREATMENT SYSTEM	LS	1	
62	12010-X-X	SCULPTURE FOOTING	LS	1	
63	12030-X-X	ELECTRICAL CONDUIT/WIRING	LS	1	

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BMI PROJ. NO. 0T6.128279

REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
QUANTITIES

SHEET C.02

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2010-C	CLEARING AND GRUBBING A. THIS ITEM SHALL INCLUDE ALL NECESSARY TRIMMING AND CLEARING AND GRUBBING TO COMPLETE CONSTRUCTION. PROTECTION OF ALL TREES NOT MARKED FOR REMOVAL SHALL BE INCIDENTAL TO THIS ITEM.
2	2010-D-1	TOPSOIL, ON-SITE TOPSOIL WITHIN THE GRADING LIMITS OF THE PROJECT SHALL BE STRIPPED, SALVAGED, AND RESPREAD AT A MINIMUM DEPTH OF 6". ITEM INCLUDES HAULING OFF-SITE TO STORE AND HAULING BACK IN IF NEEDED. CONTRACTOR TO PAY FOR RESTORATION COST IF LOCATED OUTSIDE OF THE RIGHT OF WAY.
3	2010-D-2	TOPSOIL, COMPOST AMENDED A. BID ITEM IS FOR THE PLACEMENT OF COMPOST AMENDED TOPSOIL WITHIN THE PLANTING AREAS. PLACE AT 12-INCH MINIMUM DEPTH. AMENDED SOIL SHALL BE MEASURED AND PAID BY THE CUBIC YARD OF SATISFACTORY PLACEMENT MATERIAL. CONTRACTOR SHALL FULLY MIX THE FOLLOWING THREE COMPONENTS: A. TOPSOIL, 60% (BY VOLUME) B. COMPOST, 30% (BY VOLUME) C. SAND, 10% (BY VOLUME)
4	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 STRIPPING, STOCKPILING, FURNISHING AND SPREADING OF TOPSOIL. C. ALL BORROW SHALL BE PROVIDED BY THE CONTRACTOR. EXCESS OR UNSUITABLE EXCAVATED MATERIAL WILL BECOME PROPERTY OF THE CONTRACTOR AND WILL BE HAULED OFF-SITE INCIDENTAL TO THE ITEM. NO ADDITIONAL PAYMENT WILL BE ALLOWED FOR OVERHAUL OF WASTE. 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. 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. F. EXCAVATION QUANTITIES WERE CALCULATED FROM BOTTOM OF EXISTING PAVEMENT TO BOTTOM OF PROPOSED SUBBASE. CUT = 1960 CY, FILL + 30% = 60 CY, NET = 1900 EXCESS
5	2010-J	SUBBASE, TEMPORARY GRANULAR MATERIAL A. THIS ITEMS SHALL BE FOR ESTABLISHING A TEMPORARY CONSRUCTION ACCESS ROAD AND STOCKPILE AREA FOR THE PROJECT AS SHOWN ON THE J SHEETS. B. THIS ITEM SHALL INCLUDE STRIPPING AND STOCKPILE OF TOPSOIL UNDER PROPOSED ACCESS ROAD AND STOCKPILE AREA, PLACEMENT OF GRANULAR MATERIAL TO CREATE A STABLE ACCESS ROUTE, MAINTENANCE OF ROAD THROUGHOUT CONSTURCITON INCLUDING ADDING ADDITIONAL GRAVEL AS NEEDED TO MAINTAIN ACCESS, REMOVAL OF GRANULAR MATERIAL, RESPREADING OF TOPSOIL OVER AFFECTED AREAS AND RESEADING WITH SUDAS TYPE 1 SEED. C. ANY ADDITIONAL AREA OUTSIDE OF THE AREA SHOWN ON THE J SHEET SHALL BE APPROVED BY THE ENGINEER PRIOR TO DISTURBANCE.
6	2010-J	SUBBASE, MODIFIED, 4 INCHES A. REFER TO B SHEETS FOR TYPICAL SECTIONS.
7	2010-J	SUBBASE, MODIFIED, 24 INCHES A. REFER TO B SHEETS FOR TYPICAL SECTIONS. B. SUBBASE SHALL BE INSTALLED IN 6 INCH LIFTS AND COMPACTED FOR EACH LIFT. C. IF UTILITY CONFLICTS ARE PRESENT COORDINATE WITH THE ENGINEER ON APPLICATION OF THIS ITEM PRIOR TO INSTALLATION.
8	2010-K-1	REMOVAL OF STRUCTURE, SANITARY LIFT STATION MANHJOLE A. CONTACTOR SHALL REMOVE EXISITNG LIFT STATION MANHOLE INCLUDING ALL ELECTRICAL CONNECTIONS AND OTHER ASSOCIATED ITEMS WITH THE LIFT STATION. CONTRACTOR SHALL PROTECT EXISTING FORCEMAIN DURING REMOVAL.
9	2010-M	COMPACTION TESTING 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.
10	4010-E	SANITARY SEWER SERVICE A. ALL SANITARY SEWER SERVICES SHALL BE PVC (SDR 26) B. FURNISHING AND PLACEMENT OF ELBOWS AND TEES, BEDDING MATERIAL, AND GRANULAR BACKFILL MATERIAL SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM C. ALL VISIBLE LEAKS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL PROVIDE AS-CONSTRUCTED LOCATIONS OF ALL SERVICES. D. PAYMENT SHALL BE PER EACH SERVICE INSTALLED REGARDLESS OF LENGTH. E. SANITARY SEWER SERVICES SHALL INCLUDE SERVICE FROM THE BUILDING TO THE NEW LIFT STATION AND FROM THE BACKWASH MANHOLE TO THE NEW LIFT STATION. SERVICE FROM THE RINSE STATION SHALL BE INCIDENTAL TO THE BUILDING.
11	4020-A-1	STORM SEWER, TRENCHED, RCP, 15 INCH A.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 TELEVISE 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.
12	4020-A-1	STORM SEWER, TRENCHED, RCP, 24 INCH A.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 TELEVISE 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.
13	4020-C	LINEAR TRENCH DRAIN (LEAPING JET TROUGH) A. THIS ITEMS INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR COMPLETE FURNISHING AND INSTALLATION OF ALL COMPONENTS OF THE LINEAR TRENCH DRAIN AS INDICATED IN THE DRAWINGS, SPECIAL PROVISIONS, SHOP DRAWINGS, AND ALL MANUFACTURER-PROVIDED INSTALLATION REQUIREMENTS. B.TRENCH DRAIN LOCATIONS ARE IDENTIFIED ON THE D SHEETS AND DETAILS ARE LOCATED ON THE B SHEETS. PAVERS, GRATES, STEEL FRAME, AND SUBBASE ARE INCIDENTAL.
14	4030-B	PIPE APRON, RCP, 15 INCH A. ITEM SHALL INCLUDE FOOTING AS DETAILED ON FIGURE 4030.221 AND GUARD AS DETAILED ON FIGURE 4030.224
15	4030-B	PIPE APRON, RCP, 24 INCH A. ITEM SHALL INCLUDE FOOTING AS DETAILED ON FIGURE 4030.221 AND GUARD AS DETAILED ON FIGURE 4030.224
16	4040-A	SUBDRAIN, HDPE, 4 INCH A. REFER TO M SHEETS FOR LOCATIONS . 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. B. SUBDRAINS SHALL BE CASE C TYPE 1 AND WRAPPED IN ENGINEERING FABRIC PER SUDAS DETAIL 4040.231
17	4040-C-1	SUBDRAIN CLEANOUT, 4 INCH A. REFER TO M SHEETS FOR LOCATIONS. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, PIPE, NON-SHRINK GROUT, AND COUPLING BANDS. B. CLEAN OUT SHALL BE TYPE A-1 PER SUDAS DETAIL 4040.232
18	5010-E-1	WATER SERVICE PIPE, PVC, 2 INCH A. THIS ITEM SHALL INCLUDE INSTALLATION OF WATER SERVICE, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN AND ALL FITTING NECESSARY FOR THE WATER SERVICE INCLUDING ANY NEEDED TO AVOID ANY OBJECTS IN THE WAY OF THE WATER SERVICE. B. TRACER WIRE SHALL BE INSTALLED ALONG THE ENTIRE WATER SERVICE. TRACER WIRE SHALL COMPLY WITH SUDAS 5010.205.B AND DETAIL WM-102. TRACER WIRE BOXES SHALL BE INCLUDED IN THIS ITEM INCLUDING A BOX AT THE TAPPING VALVE AND SLEEVE.
19	5010-E-1	WATER SERVICE PIPE (TRENCHLESS), PVC, 2 INCH A. THIS ITEM SHALL INCLUDE INSTALLATION OF TRENCHLESS WATER SERVICE UNDER WASHINGTON STREET, CONNECTION TO WATERMAIN, ALL NECESSARY FITTINGS FOR CONNECTION AT MAIN. B. TRACER WIRE SHALL BE INSTALLED ALONG THE ENTIRE WATER SERVICE. TRACER WIRE SHALL COMPLY WITH SUDAS 5010.205.B AND DETAIL WM-102. TRACER WIRE BOXES SHALL BE INCLUDED IN THIS ITEM INCLUDING A BOX AT THE TAPPING VALVE AND SLEEVE.
20	5010-F	WATER SERVICE ABANDONMENT A. CONTACTOR SHALL ABANDON EXISTING WATER SERVICE AT THE MAIN ON WASHINGTON STREET. CONTRACTOR SHALL COORDINATE WITH MARSHALLTOWN WATER WORKS ON ABANDONMENT OF EXISTING SERVICE AT THE MAIN.
21	5020-B	TAPPING VALVE ASSEMBLY, 2 INCH A. CONTRACTOR SHALL CONNECT TO EXISTING WATER MAIN. CONTRACTOR SHALL COORDINATE WITH MARSHALLTOWN WATER WORKS ON CONNECTION. B. THIS ITEM SHALL INCLUDE ANY LABOR, MATERIAL AND PARTS NEEDED TO MAKE CONNECTION.
22	6010-A	PACKAGE GRINDER LIFT STATION A. REFER TO SPECIFICATIONS FOR REQUIREMENT OF SANITARY SEWER LIFT STATION. B. CONNECTION TO EXISTING SANITARY FORCE MAIN IS INCIDENTAL TO THIS ITEM.
23	6010-A	WATER MAIN MANHOLE, SW-401 A. REFER TO M SHEETS FOR WATER MAIN MANHOLE LOCATION. B. WATERMAIN MANHOLE SHALL BE UTILZIED TO DRAIN SERVICE LINE FOR WINTER SHUTDOWN. WATER SERVICE AT THE MANHOLE SHALL BE THE LOWEST POINT OF THE SERVICE LINE FOR DRAINING. C. THIS ITEM INCLUDES THE NECESSARY TEE, VALVE AND PIPING NEEDED TO DRAIN THE LINE. D. MANHOLE BOTTOM SHALL BE REMOVED AND FILLED WITH AT LEAST 36" OF ROCK TO ALLOW FOR DRAINING LINE.
24	6010-A	STORM SEWER OUTLET STRUCTURE A. REFER TO M SHEETS FOR STORM SEWER LOCATION B. MANHOLE CASTINGS SHALL READ "STORM SEWER"
25	6010-A	STORM MANHOLE, SW-402 A. REFER TO M SHEETS FOR STORM SEWER LOCATION B. MANHOLE CASTINGS SHALL READ "STORM SEWER"
26	6010-X	SW-512, 18" A. REFER TO M SHEETS FOR STORM SEWER LOCATION B. 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. C. CASTING SHALL BE SW-604 3B
27	7010-A	PAVEMENT, PCC, 5 INCH A. REFER TO B SHEETS FOR TYPICAL SECTIONS. 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. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. C. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. D. 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. E. REBAR SHALL BE NON-EPOXY COATED REBAR

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REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
ESTIMATE REFERENCE NOTES

SHEET
C.03

28	7010-A	PAVEMENT, PCC, 6 INCH REINFORCED (WET DECK) A. REFER TO B SHEETS FOR TYPICAL SECTIONS. 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. LOW AIR TOLERANCE LIMIT PER 7010-3.08-B. C. NO ADDITIONAL PAYMENT WILL BE MADE FOR COLD WEATHER CONCRETE OR COVERING IF REQUIRED. D. 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. E. CONCRETE SHALL HAVE #4 REBAR SPACED AT 6" ON CENTER EACH DIRECTION. REBAR SHALL BE NON-EPOXY COATED REBAR
29	7010-A	NON-SKID RUBBERIZED COATING A. INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR FURNISHING AND COMPLETE APPLICATION OF NON-SKID RUBBERIZED COATING. B. MEASUREMENT AND PAYMENT SHALL BE PER SQUARE FOOT OF COATING AS SPECIFIED ON THE DRAWINGS. C. ALL SURFACE PREP AND PRIMING COATS ARE CONSIDERED INCIDENTAL. D. SEE SUPPLEMENTAL SPECIFICATIONS FOR NON-SKIP RUBBERIZED COATING (TUFFCOAT) IN CONTRACT DOCUMENTS.
30	7010-I	PCC PAVEMENT SAMPLES AND TESTING 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 ALL PCC PAVEMENT.
31	7030-A-1	REMOVAL OF SIDEWALK A. ALL REMOVALS TO BE MARKED AND MEASURED BY THE ENGINEER. FULL DEPTH SAW CUTS ALONG THE REMOVAL LIMITS ARE INCIDENTAL TO THIS ITEM. B. 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. C. PAYMENT SHALL BE MADE FOR THE AREA OF PAVEMENT REMOVED REGARDLESS OF THICKNESS.
32	7040-A	FULL DEPTH PATCHES, PCC, 7 INCH A. THIS ITEM SHALL FOLLOW SUDAS FOR ALL REQUIREMENTS INCLUDING FIGURE 7040.102 FOR PATCH LONGER THAN 15' AND 7040.101 FOR PATCH LESS THAN 15' B. THIS ITEM SHALL INCLUDE CONCRETE TESTING FOR ALL PATCHING. C. THIS PATCH SHALL BE COMPELTED UTILZING HIGH EARLY STRENGTH PATHING MATERIAL.
33	8030-A	TEMPORARY TRAFFIC CONTROL A. THIS ITEM SHALL INCLUDE TEMPORARY TRAFFIC CONTROL FOR THE FULL DEPTH PATCHING ON WASHINGTON STREET. IOWA DOT TRAFFIC CONTROL TC-211 IS ANTICPATED TO BE UTILIZED DURING THE WORK ON WASHINGTON STREET. B. CONCTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR APPROVAL BY THE ENGINEER AND OWNER.
34	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 1 - PERMANENT LAWN A. SEED ALL AREAS DISTURBED BY CONSTRUCTION AS INDICATED ON PLANS. B. THE COST FOR WATERING UNTIL SEED ESTABLISHMENT IS ACCEPTED SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ROCK PICKING, FINISH GRADING, SEED BED PREP AND RESEEDING ARE CONSIDERED INCIDENTAL TO THIS ITEM. C. SEED AND FERTILIZER SHALL BE APPLIED PRIOR TO MULCHING. D. THE CONTRACTOR IS RESPONSIBLE FOR MOWING AND MAINTAINING SEEDED AREAS UNTIL THE PROJECT IS ACCEPTED BY THE OWNER. E. SEEDING OF AREAS DISTURBED OUTSIDE OF THE CONSTRUCTION LIMITS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER. F. THE SEEDING RATE SHALL BE AT LEAST 260 LBS/ACRE. APPLY A 6-24-24, NITROGEN, PHOSPHATE, POTASH, COMMERCIAL FERTILIZER OR EQUIVALENT AT THE RATE OF 300 LBS PER ACRE. APPLY MULCHING PER MANUFACTERS RECOMMENDATIONS.
35	9020-A	SOD A. SOD AREAS INDICATED IN THE DRAWING SET. B. THE COST FOR WATERING SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ROCK PICKING, FINISH GRADING. C. NO ADDITIONAL PAYMENTS WILL BE MADE FOR RESODDED AREAS. D. THE CONTRACTOR IS RESPONSIBLE FOR MOWING AND MAINTAINING SODDED 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 OWNER.
36	9030-B	PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL) A. THIS ITEM INCLUDES LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL TREES AS INDICATED IN THE PLANS. B. PLANTINGS SHALL HAVE ONE YEAR WARRANTY FROM DATE OF FINAL ACCEPTANCE FOR ALL PLANTINGS IN THE PROJECT. C. ACCEPTANCE OF PLANT MATERIALS CONSTRUES FULL PAYMENT (MINUS ANY PROJECT RETAINAGE). D. INCLUDES ALL, BUT NOT LIMITED TO, WATERING , AMENDED SOILS DELIVERY, EXCAVATION, INSTALLATION, MULCHING, HERBICIDE, MAINTENANCE DURING ESTABLISHMENT PERIOD, AND WARRANTY AND REJECTION REPLACEMENTS.
37	9030-B	PLANTS WITH WARRANTY, DECIDUOUS TREE A. THIS ITEM INCLUDES LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL TREES AS INDICATED IN THE PLANS. B. PLANTINGS SHALL HAVE ONE YEAR WARRANTY FROM DATE OF FINAL ACCEPTANCE FOR ALL PLANTINGS IN THE PROJECT. C. ACCEPTANCE OF PLANT MATERIALS CONSTRUES FULL PAYMENT (MINUS ANY PROJECT RETAINAGE). D. INCLUDES ALL, BUT NOT LIMITED TO, WATERING BAG, AMENDED SOILS DELIVERY, EXCAVATION, INSTALLATION, MULCHING, HERBICIDE, MAINTENANCE DURING ESTABLISHMENT PERIOD, AND WARRANTY AND REJECTION REPLACEMENTS.
38	9040-A-1	SWPPP PREPARATION A. THIS ITEM INCLUDES DEVELOPMENT OF A SWPPP BY THE CONTRACTOR MEETING ALL LOCAL AND STATE AGENCY REQUIREMENTS. B. CONTRACTOR SHALL BE RESPONSIBLY FOR OBTAINING NPDES GENERAL PERMIT #2. PERMIT SHALL BE OBTAINED AND A COPY PROVIDED TO THE CITY PRIOR TO ANY WORK ON THE PROJECT. C. CONTRACTOR SHALL SUBMIT CITY OF MARSHALLTOWN EROSION CONTORL PERMIT AFTER NPDES PERMIT #2 IS OBTAINED AND PRIOR TO STARTING WORK.
39	9040-A-2	SWPPP MANAGEMENT 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.
40	9040-D-1	FILTER SOCK/WATTLE A. THIS ITEM INCLUDES, BUT IS NOT LIMITED TO, ANCHORING STAKES, MAINTENANCE, REPLACEMENT OF DEFICIENT FILTER SOCK, RESTORATION OF THE AREA TO FINISHED GRADE, AND OFF-SITE DISPOSAL OF THE FILTER SOCK AND ACCUMULATED SEDIMENT.
41	9040-J	RIP RAP, CLASS E A. REFER TO EROSION CONTROL SHEETS FOR LOCATION.
42	9040-N-1	SILT FENCE OR SILT FENCE DITCH CHECK A. ITEM INCLUDES INSTALLATION, MAINTENANCE AND REMOVAL OF SILT FENCE. B. PAYMENT QUANTITY SHALL BE LIMITED TO THE QUANTITIES LISTED IN THE ESTIMATED QUANTITIES TABLE ON SHEET C.01. IF CONTRACTOR DETERMINES THAT ADDITIONAL QUANTITY IS REQUIRED TO PROPERLY PROTECT THE SITE AS REQUIRED BY THE NPDES GENERAL PERMIT NO. 2, THEY MUST NOTIFY THE ENGINEER AND HAVE APPROVAL PRIOR TO THE INSTALLATION. ANY QUANTITY ABOVE PLAN QUANTITY INSTALLED PRIOR TO ENGINEER APPROVAL MAY NOT BE PAID.
43	9040-T-1	INLET PROTECTION DEVICE 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 OPEN THROAT INTAKE C. DOUBLE INTAKES WILL BE COMPENSATED FOR INSTALLATION OF TWO (2) INLET PROTECTION DEVICES AS INSTALLED, MAINTAINED AND REMOVED.
44	9040-V	END OF SEASON TEMPORARY EROSION CONTROL A. THIS ITEM SHALL BE FOR TEMPORARY EROSION CONTROL AND SHALL BE UTILIZED IF PERMANENT SEEDING CANNOT BE ESTABLISHED DUE TO SEASONAL CONSTRAINTS OR AFTER NORMAL SEASON SEEDING HAS BEEN PLACED. CONTRACTOR SHALL UTILIZE SUDAS TYPE 4 SEED.
45	10010-A	DEMOLITION WORK - EXISTING RESTROOMS
46	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. B. THIS ITEM SHALL ALSO INCLUDE THE COSTS FOR ANY STAGED CONSTRUCTION AND EQUIPMENT SET UP TO COMPLETE THE WORK AND TEMPORARY CHAIN LINK FENCING INSTALL, MAINTAIN, AND REMOVE A PERIMETER CHAINLINK FENCE AROUND THE CONSTRUCTION SITE. FENCE SHALL BE MAINTAINED THROUGH THE DURATION OF THE PROJECT AND ONLY REMOVED UPON FINAL ACCEPTANCE OF ESTABLISHED SEEDING BY OWNER AND/OR ENGINEER. C. NO CHANGE IN CONTRACT PRICE WILL BE MADE FOR ANY COMBINATION OF ADD/ALTERNATES ADDED TO THE CONTRACT. D. THIS ITEM TO BE PAID PER SUDAS 11,020-108-A.
47	11050-A	CONCRETE WASHOUT A. CONTRACTOR TO PROVIDE AND MAINTAIN A TEMPORARY CONCRETE WASHOUT CONTAINMENT AREA LOCATED WITHIN PROJECT LIMITS.
48	12010-X-X	FREESTANDING RINSE STATION A. THIS ITEM INCLUDES ALL LABOR, MATERIAL, AND EQUIPMENT TO FURNISH AND INSTALL THE RINSE STATION ACCORDING TO THE MANFACTURER'S REQUIREMENTS. B. WATER SERVICE CONNECTION TO THE RESTROOM BUILDING IS INCIDENTAL TO THIS ITEM.
49	12010-X-X	RESTROOM A. THIS ITEMS INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR COMPLETE FURNISHING AND INSTALLATION OF ALL COMPONENTS OF THE RESTROOM AS INDICATED IN THE DRAWINGS, SHOP DRAWINGS, PERMITTING, COMMISSIONING, DELIVERY, INSTALLATION OF RESTROOM STRUCTURE INCLUDING EXCAVATION AND BACKFILL, UTILITY CONNECTIONS, CONCRETE FOOTINGS AND STOOPS, CONCRETE FLOOR SLAB, AND TESTING. B. RESTROOM LOCATION IS IDENTIFIED ON THE D SHEETS AND MANUFACTURER'S PRELIMINARY CUTSHEETS ARE IDENTIFIED IN THE B SHEETS. INCIDENTAL TO THIS WILL BE PAID FOR ON A LUMP SUM BASIS.
50	12010-X-X	BENCH TYPE 1 (CURVED BENCH, SINGLED SIDED) A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL CUSTOM RADIUS CURVED BENCHES. SEE PLANS FOR LOCATION, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH.
51	12010-X-X	BENCH TYPE 2 (CURVED BENCH, DOUBLE SIDED) A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL CUSTOM RADIUS CURVED BENCH. SEE PLANS FOR LOCATION, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH.
52	12010-X-X	BENCH TYPE 3 (METAL BACKED BENCH) A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL METAL BENCHES. ITEM TO BE CUSTOM LASER CUT PATTERN, SEE B SHEETS. SEE PLANS FOR LOCATIONS, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH.
53	12010-X-X	LITTER RECEPTACLE A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL LITTER RECEPTACLES. ITEM TO BE CUSTOM LASER CUT PATTERN, SEE B SHEETS. SEE PLANS FOR LOCATIONS, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH.
54	12010-X-X	CONCRETE PEBBLE A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL CUSTOM RADIUS CURVED BENCH. SEE PLANS FOR LOCATION, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH.
55	12010-X-X	DECORATIVE METAL PANEL A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL DECORATIVE METAL PANELS AND FOOTINGS. ITEM INCLUDES BASE PLATE AND BRACKET. SEE PLANS FOR LOCATION, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH.
56	12010-X-X	DECORATIVE ACRYLIC PANEL ATTACHMENT A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL ACRYLIC PANEL ATTACHMENTS TO THE METAL PANEL WALLS. ITEM TO INCLUDE ALL SCREWS, PINS, BOLTS, AND RESIN CAPS. SEE PLANS FOR LOCATION, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR FOR ON A COUNT BASIS PER EACH.
57	12010-X-X	SIGN TYPE 1 (PARK SIGN) A. THIS ITEM INCLUDES LABOR, MATERIALS, AND EQUIPMENT TO FURNISH AND INSTALL SIGN TYPE 1 AND FOOTING. ITEM INCLUDES METAL PANEL, STAINLESS STEEL CUT LETTERS, PINS, SCREWS AND BOLTS, BASE BRACKET, AND FOOTINGS. SEE K SHEETS FOR LOCATION AND B SHEETS FOR DETAILS. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH. ALL ITEMS NECESSARY FOR COMPLETE FABRICATION AND INSTALLATION ARE CONSIDERED INCIDENTAL TO THIS ITEM.
58	12010-X-X	SIGN TYPE 2 (DONOR SIGN) A. THIS ITEM INCLUDES LABOR, MATERIALS, AND EQUIPMENT TO FURNISH AND INSTALL SIGN TYPE 2 AND FOOTING. ITEM INCLUDES ALL METAL PANEL, ACRYLIC PLAQUES, DIGITAL TEXT INTEGRAL TO SIGN, SCREWS AND BOLTS, RESIN CAPS, BASE BRACKET, AND FOOTINGS. SEE K SHEETS FOR LOCATION AND B SHEETS FOR DETAILS. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH. ALL ITEMS NECESSARY FOR COMPLETE FABRICATION AND INSTALLATION ARE CONSIDERED INCIDENTAL TO THIS ITEM.

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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

ESTIMATE REFERENCE NOTES

SHEET C.04

59	12010-X-X	SIGN TYPE 3 (DONOR STORY SIGN) A. THIS ITEM INCLUDES LABOR, MATERIALS, AND EQUIPMENT TO FURNISH AND INSTALL SIGN TYPE 3 AND FOOTING. ITEM INCLUDES ALL METAL PANEL, ACRYLIC PLAQUES, DIGITAL TEXT INTEGRAL TO SIGN, SCREWS AND BOLTS, RESIN CAPS, BASE BRACKET, AND FOOTINGS. SEE K SHEETS FOR LOCATION AND B SHEETS FOR DETAILS. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH. ALL ITEMS NECESSARY FOR COMPLETE FABRICATION AND INSTALLATION ARE CONSIDERED INCIDENTAL TO THIS ITEM.
60	12010-X-X	BIKE RACK A. THIS ITEM INCLUDES LABOR, MATERIALS AND EQUIPMENT TO FURNISH AND INSTALL BIKE RACKS. SEE PLANS FOR LOCATIONS, DETAILS, AND SPEC INFORMATION. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS PER EACH.
61	12010-X-X	WATER FEATURE AND TREATMENT SYSTEM A. THIS ITEM INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR PROCUREMENT AND COMPLETE INSTALLATION OF THE WATER PLAZA FEATURES AND WATER DISTRIBUTION SYSTEM EQUIPMENT AS INDICATED IN THE DRAWINGS AND SPECS STARTING AT THE LIFT STATION TO WATER SERVICE LINE. THIS ITEM INCLUDES PRECAST VAULT, 1-2"CLEAN DRAINAGE STONE, VAULT HATCH LID, BACKWASH PIT, AND ALL UTILITY, ELECTRICAL, AND MECHANICAL CONNECTIONS BETWEEN CONTROLLER, LIFT STATION AND WATER PLAZA FEATURES AS REQUIRED FOR COMPLETE INSTALLATION. ALL FIXTURES, REBAR, NOZZLES, AND ANY OTHER MATERIAL, SHALL BE BONDED IN ACCORDANCE WITH LOCAL CODE AND CONSIDERED PART OF THE LUMP SUM WORK ASSOCIATED WITH THE INSTALLATION OF THE WATER PLAZA FEATURES AND WATER DISTRIBUTION SYSTEM. CONTRACTOR RESPONSIBLE FOR ALL PERMITTING AND COORDINATION WITH WATER FEATURE MANUFACTURER FOR SHOP DRAWINGS THAT INCLUDES FINAL P&E DRAWINGS OF THE WATER FEATURE COMPLETE. B. ALL SHOP DRAWINGS MUST BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.
62	12010-X-X	SCULPTURE FOOTING A. THIS ITEM INCLUDES LABOR, MATERIALS, AND EQUIPMENT TO FURNISH MATERIALS AND CONSTRUCT THE CONCRETE FOOTING SUPPORTING THE INSTALLED SCULPTURE. ITEM IS TO BE MEASURED AND PAID FOR ON A COUNT BASIS FOR EACH CONCRETE PIER CONSTRUCTED. ALL ITEMS NECESSARY FOR COMPLETE EXCAVATION, REINFORCING, TESTING AND PLACEMENT OF CONCRETE, BACKFILL AND ANY OTHER ITEMS REQUIRED FOR COMPLETE CONSTRUCTION OF THE PIER FOUNDATIONS ARE CONSIDERED INCIDENTAL TO THIS ITEM. MOCKUPS TO BE USED FOR QUALITY CONTROL, AS STATED IN THE SPEC, ARE ALSO INCIDENTAL TO THIS ITEM.
63	12030-X-X	ELECTRICAL CONDUIT/WIRING A. INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR FURNISHING AND COMPLETE INSTALLATION OF ALL COMPONENTS FOR THE ELECTRICAL SYSTEM AS INDICATED IN THE DRAWINGS AND SPECIFICATIONS. ASSUME NO UPDAGRADES TO SERVICE CABINET. MEASUREMENT AND PAYMENT SHALL BE LUMP SUM FOR COMPLETE INSTALLATION OF THE ELECTRICAL SYSTEMS. ALL ELECTRICAL PEDESTALS/TRANSFORMERS/CABINETS, CONNECTIONS, LIGHTING FIXTURES AND PHOTOCELLS, CONDUIT AND WIRING, HANDHOLES, BREAKERS, DUPLEX RECEPTACLES, TRENCHING, EXCAVATION, AND BACKFILL ARE CONSIDERED INCIDENTAL TO THIS ITEM.

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CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
ESTIMATE REFERENCE NOTES

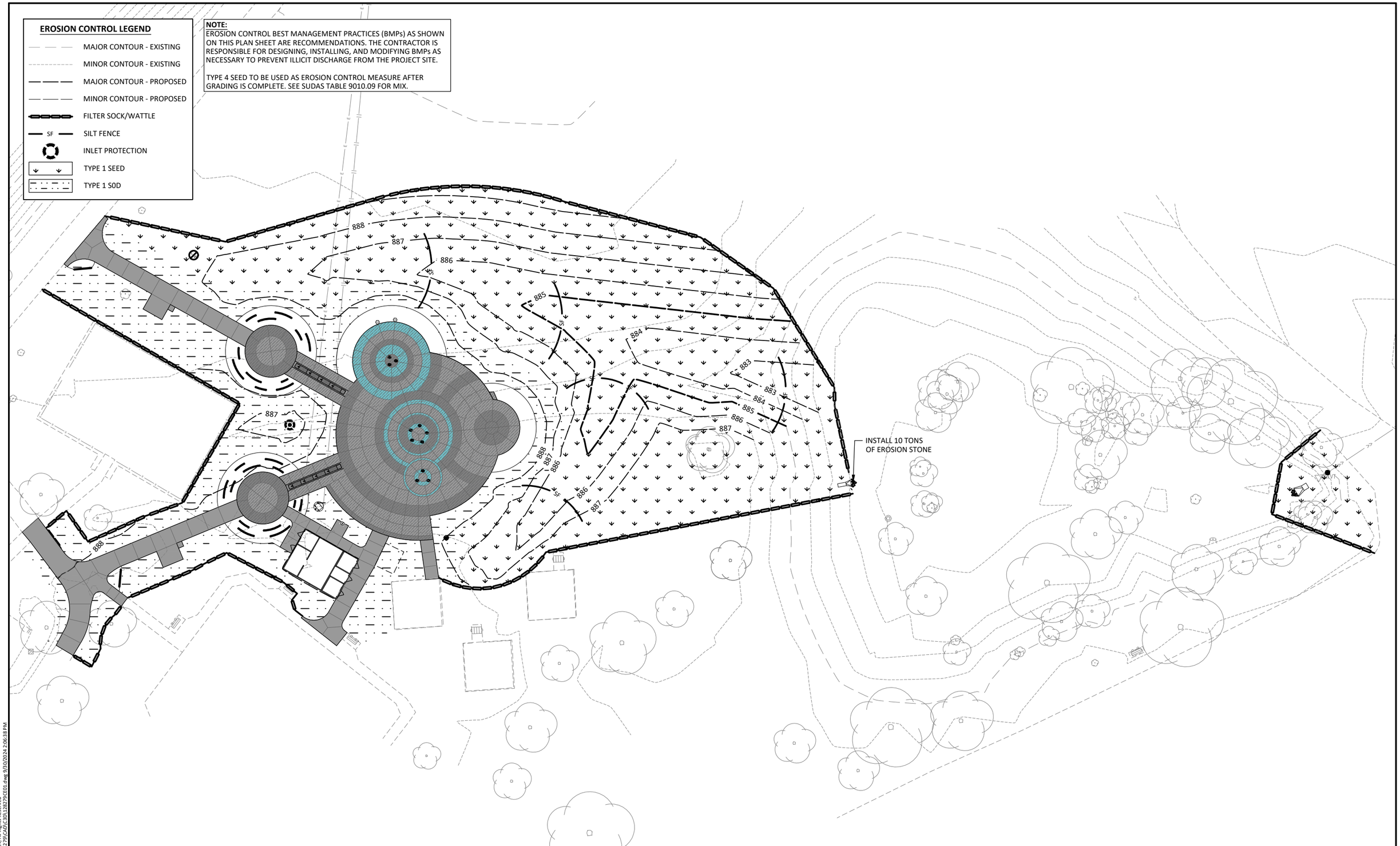
SHEET C.05

EROSION CONTROL LEGEND

- MAJOR CONTOUR - EXISTING
- MINOR CONTOUR - EXISTING
- MAJOR CONTOUR - PROPOSED
- MINOR CONTOUR - PROPOSED
- FILTER SOCK/WATTLE
- SF — SILT FENCE
- INLET PROTECTION
- TYPE 1 SEED
- TYPE 1 SOD

NOTE:
EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPs) AS SHOWN ON THIS PLAN SHEET ARE RECOMMENDATIONS. THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING, INSTALLING, AND MODIFYING BMPs AS NECESSARY TO PREVENT ILLICIT DISCHARGE FROM THE PROJECT SITE.

TYPE 4 SEED TO BE USED AS EROSION CONTROL MEASURE AFTER GRADING IS COMPLETE. SEE SUDAS TABLE 9010.09 FOR MIX.



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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

EROSION CONTROL

SHEET CE.01

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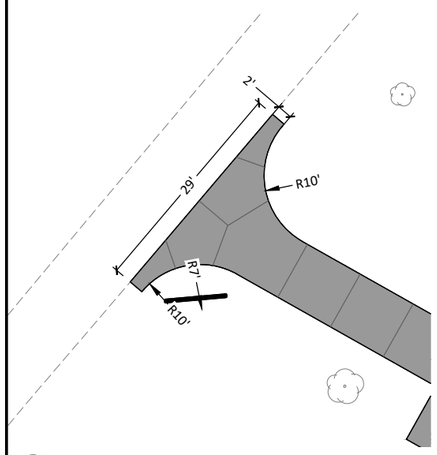
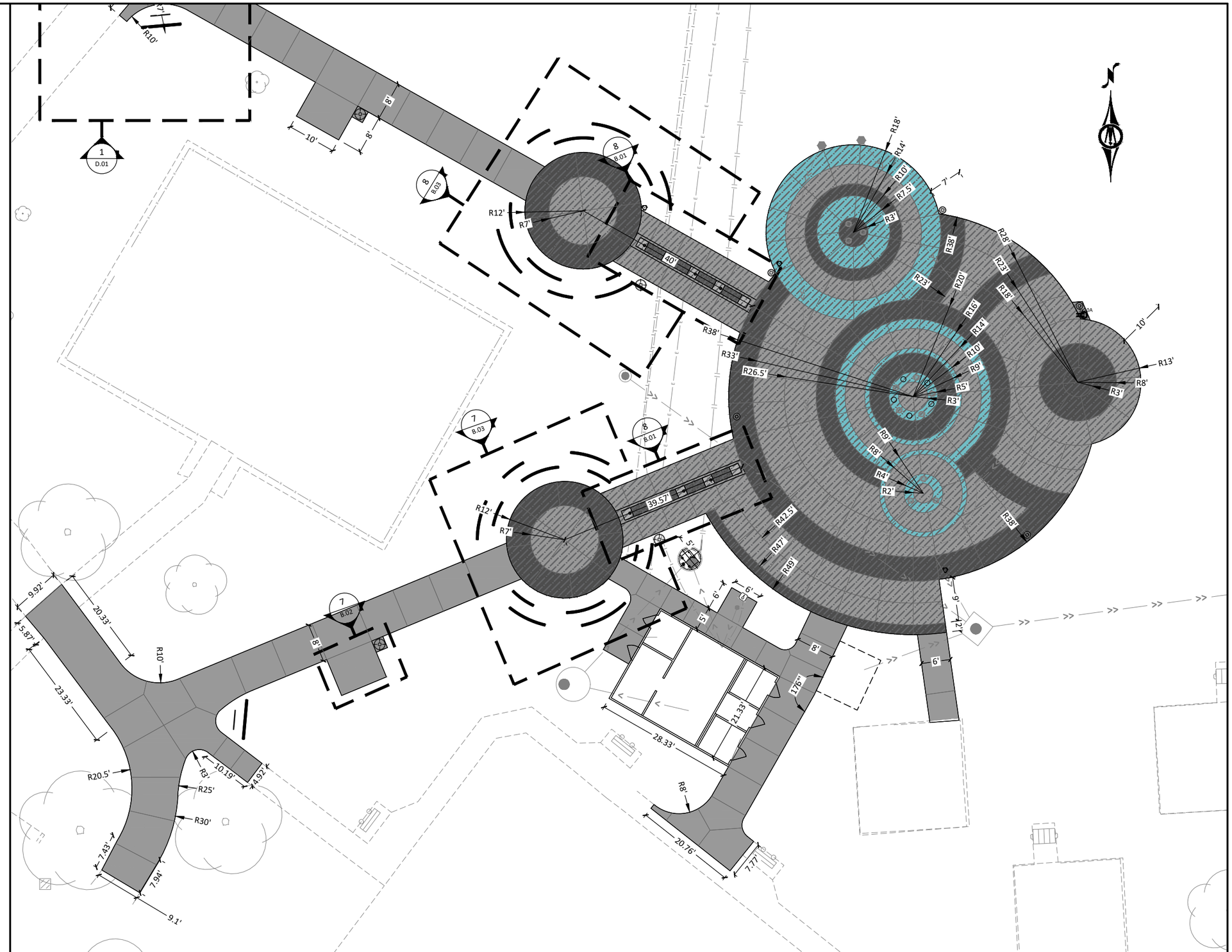
PAVEMENT LEGEND

- PAVEMENT, PCC, 5 INCH
- PAVEMENT, PCC, 6 INCH REINFORCED
- NON-SKID RUBBERIZED COATING, TYPE 1
- NON-SKID RUBBERIZED COATING, TYPE 2
- TRENCH DRAIN PAVERS



1 FIGURE ONE



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SCALE FEET

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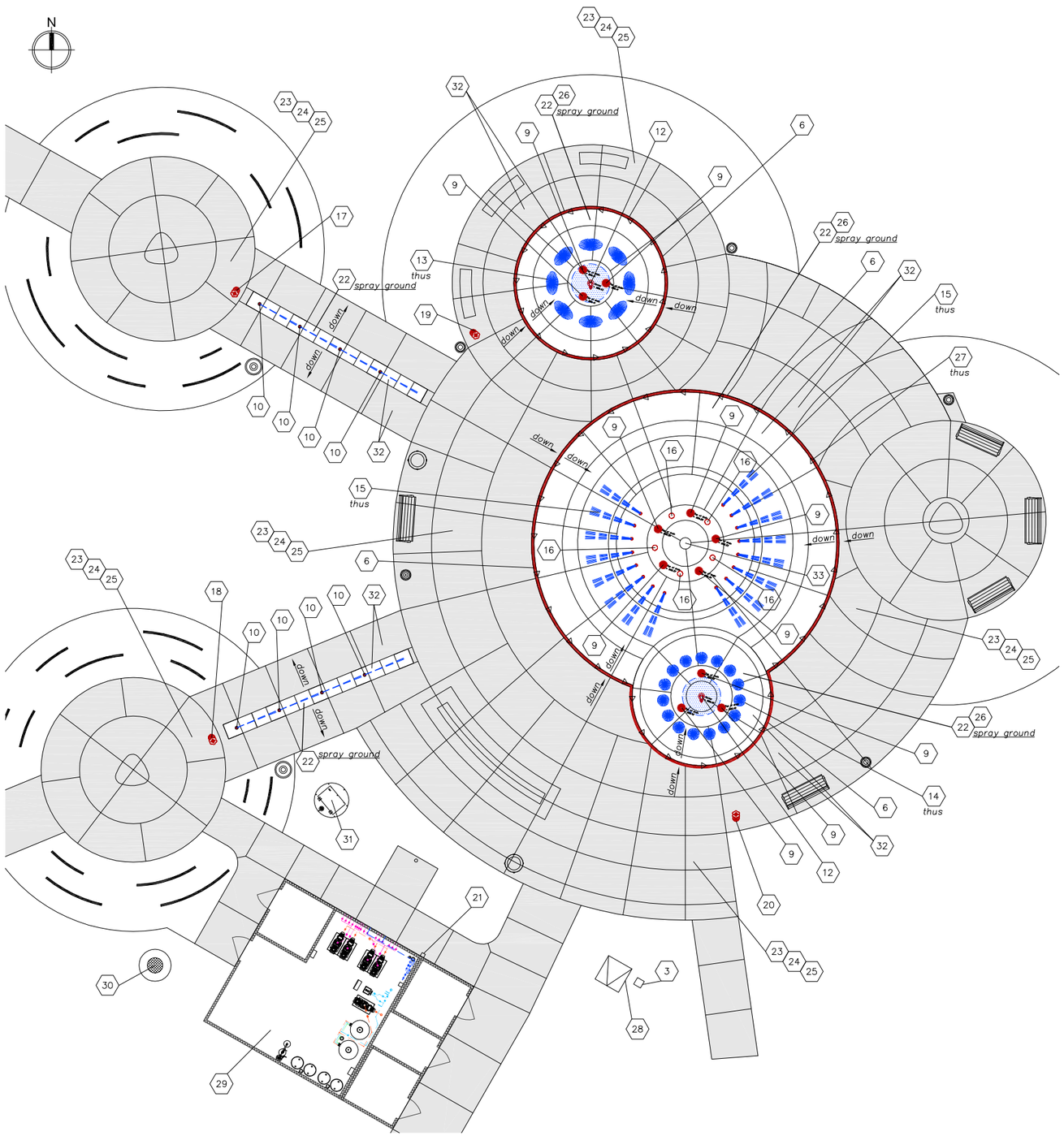
CITY OF MARSHALLTOWN, IOWA

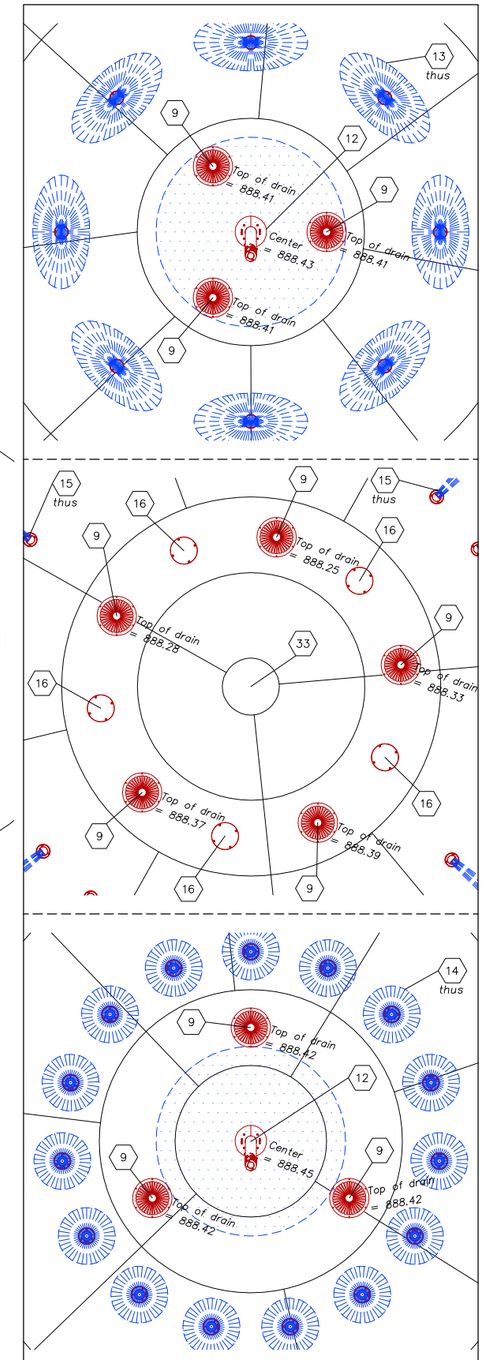
WATER PLAZA AT MEGA-10 PARK

DIMENSION PLAN

SHEET D.01



A WATER PLAZA PLAN
Scale: 1/8=1'-0"



B WATER PLAZA DECK ELEVATIONS
Scale: 1/2=1'-0"

SPRAY GROUND AREA KEY NOTES

1. Subgrade ~ See Detail A–D.04 and Sheet B.01
2. Underdrain ~ See Sheet M.01
3. Off–season water diverter
   ~ Provide tee with eccentric reducer (flat side on bottom)
   ~ Provide valve box, with valve and operator
   ~ Valve normally closed, open for off–season
4. Off–season water diverter and wet pit drain pipe to manhole on Sheet M.01
5. All piping shall slope uniformly to drain by gravity
6. Deck drain – trench ~ See Detail B–D.04 (for adjacent sidewalk pavement drainage)
7. Deck drain – trench – bottom outlet ~ See Detail B–D.04
8. Deck drain – trench – bottom outlet drain pipe to manhole on Sheet M.01
9. Decorative drain ~ See Detail C–D.04 (for spray ground area drainage)
10. Leaper – Directional Jet No. 3 ~ See Detail D–D.04, and Sheet D.03 for data
11. Drain pipe from linear trench drain (leaping jet trough)
12. Glo Mist Nano (city water) ~ See Detail E–D.04, and Sheet D.03 for data
13. Jet Stream No. 2 ~ See Detail F–D.04, and Sheet D.03 for data
14. Spray Link No. 1 ~ See Detail G–D.04, and Sheet D.03 for data
15. Wave (4' to 5' tall) ~ See Detail F–D.04, and Sheet D.03 for data
16. LED light ~ See Detail H–D.04 and Electrical Sheets
17. Bollard activator – Zone 1 ~ See Detail I–D.04
18. Bollard activator – Zone 2 ~ See Detail I–D.04
19. Bollard activator – Zone 3 ~ See Detail I–D.04
20. Bollard activator – Zone 4 ~ See Detail I–D.04
21. Rain and wind sensors connected to water feature controller ~ See Sheet D.06
22. Spray ground area ~ See Detail A–D.04
23. Adjacent sidewalk pavement ~ See Sheet B.01
24. Adjacent sidewalk pavement scoring and color ~ See Sheet D.01
25. Adjacent sidewalk pavement grading and elevations ~ See Sheet E.01
26. 6" Thick concrete deck at spray ground areas ~ See Detail A–D.04
    ~ Deck and drain finish surface elevations ~ Deck slopes shall be 1% min. / 2% max.
    ~ Water shall not be allowed to pond in any location
27. Construction joint ~ See Detail A–D.04
28. Wet pit with access hatch ~ See Sheet D.06
29. Filter area ~ See Sheet D.06
30. Backwash pit ~ See Sheet D.06
31. Lift station ~ See Sheet M.05
32. Metallic items and surfaces shall be electrically bonded per NEC 680–26 ~ See Electrical Sheets
    ~ Spray ground rebar and adjacent concrete rebar shall be uncoated (not epoxy coated)
    ~ Contractor shall provide bonding test results to Engineer for review
33. Art installation base and foundation ~ See Detail 2–S.01

SPRAY GROUND DATA	
Spray Ground Area	1,758 S.F.

NOTE:
All items specified on this sheet except for art structure footing, surface pavement and base materials are incidental to water feature, storage and treatment system/structure.

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CITY OF MARSHALLTOWN, IOWA
MEGA-10 PARK WATER PLAZA
WATER PLAZA PLAN

SHEET D.02

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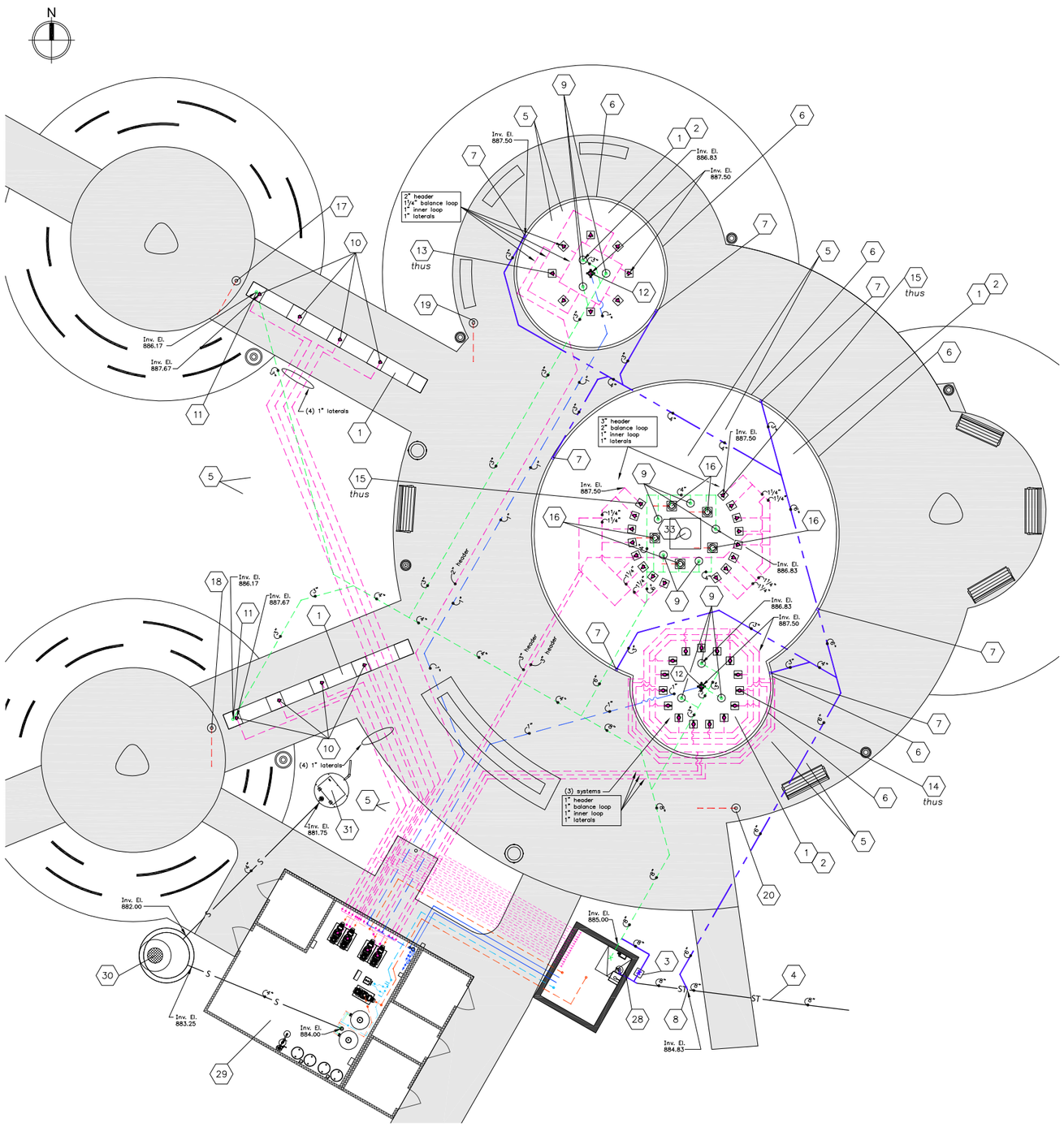

A WATER PLAZA MECHANICAL PLAN
Scale: ⅛=1'-0"

WATER FEATURE FLOW DATA					
Description	Flow	Quantity	Total Flow	Pressure	Spray Height
ZONE 1					
Leaper - Directional Jet No. 3	4 GPM	4	16 GPM	11 PSI	6' (long)
SUB TOTAL		4	16 GPM		
ZONE 2					
Leaper - Directional Jet No. 3	4 GPM	4	16 GPM	11 PSI	6' (long)
SUB TOTAL		4	16 GPM		
ZONE 3					
Glo Mist Nano (city water)	0.3 GPM	1	0.3 GPM	30 PSI	(misting)
Jet Stream No. 2	5 GPM	8	40 GPM	5 PSI	4 Ft.
SUB TOTAL		9	40 GPM		
ZONE 4					
Glo Mist Nano (city water)	0.3 GPM	1	0.3 GPM	30 PSI	(misting)
Spray Link No. 1	3 GPM	15	45 GPM	4 PSI	4 Ft.
Wave (4' to 5' tall)	10 GPM	16	160 GPM	6 PSI	4 to 5 Ft.
SUB TOTAL		32	205 GPM		
TOTAL		49	277 GPM		

PIPE TYPE NOTES

- *Spray ground system piping (drain gutter recirc features features) shall be: Sch 80 PVC*
- *Drain piping shall be: SDR 26 PVC*
- —S— *Sanitary sewer* *SDR 26 PVC*
- —ST— *Storm sewer* *SDR 26 PVC*

GENERAL SHEET NOTES

1. *All El.'s shown* Inv. El. (−)x.xx' *, are distances down from indicated Water El.*
2. *All El.'s shown* Inv. El. (+)x.xx' *, are distances up from indicated Water El.*
3. *All pipes shall slope to drain*
   ~ Slope shall be uniform between Inv. El's. shown, unless otherwise required to prevent piping conflicts
4. *Inv. El's at structures, adjacent to equipment (basket strainers, pumps, etc.), are approximate and may vary per mftr.*
   ~ Contractor shall verify
5. *All piping through concrete structures shall be cast-in-place*
   ~ No pipe sleeves or coring allowed
6. *Coordinate all items with piping*
   ~ Example...fence post footings, shade column footings, etc.
7. *Tee fitting sizes shall match that of the largest connecting pipe size*
8. *Surface sprays shall be flush with the spray pad surface*
9. *Spray openings shall have a diameter of ½" or less, noncircular spray openings shall have a width of ½" or less.*

NOTE:
All items specified on this sheet except for art structure footing, surface pavement and base materials are incidental to water feature, storage and treatment system/structure.

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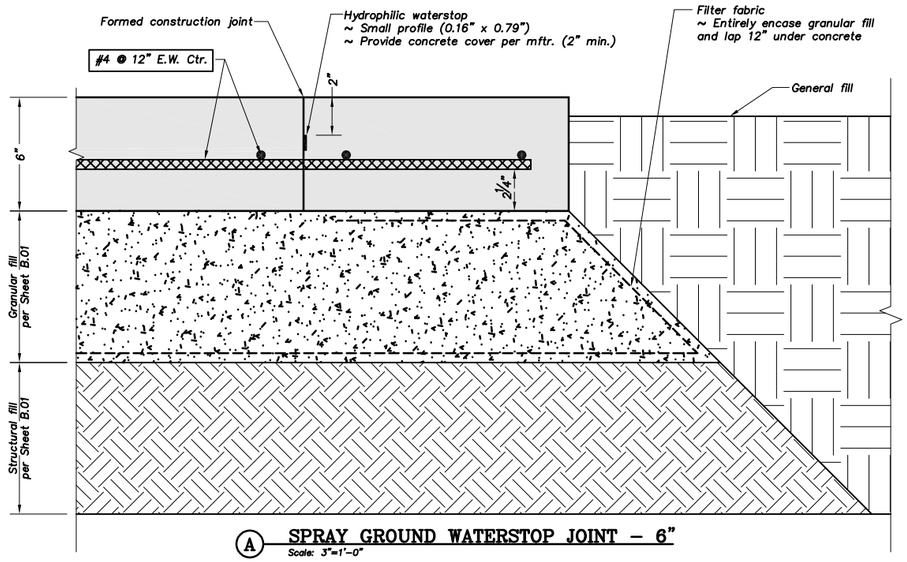
BM PROJ. NO.	0T6.128279

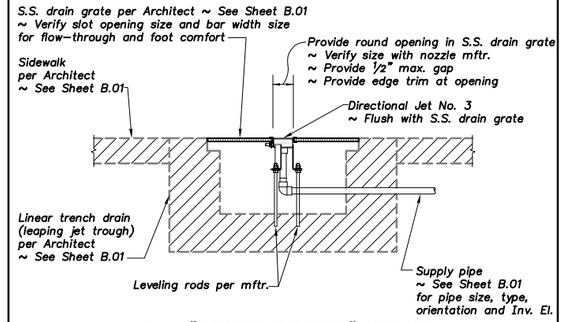
REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
MEGA-10 PARK WATER PLAZA
WATER PLAZA MECHANICAL PLAN

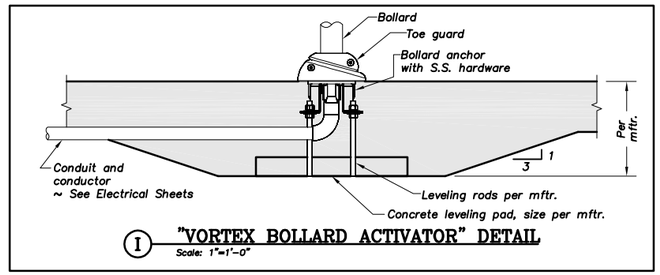
SHEET
D.03



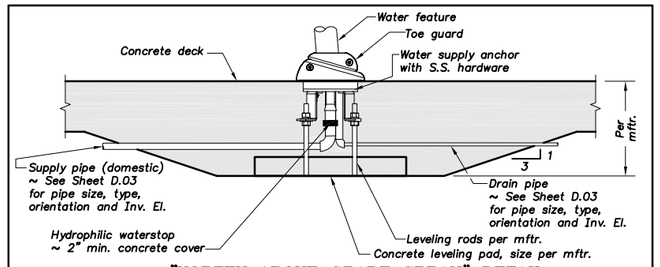
A SPRAY GROUND WATERSTOP JOINT – 6"
Scale: 3"=1'-0"



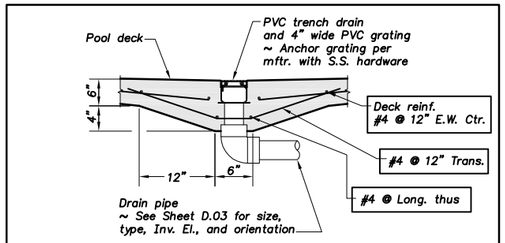
D "VORTEX LEAPER" DETAIL
Scale: 1"=1'-0"



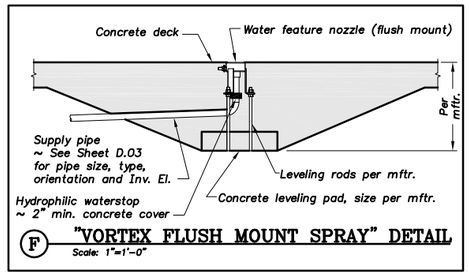
I "VORTEX BOLLARD ACTIVATOR" DETAIL
Scale: 1"=1'-0"



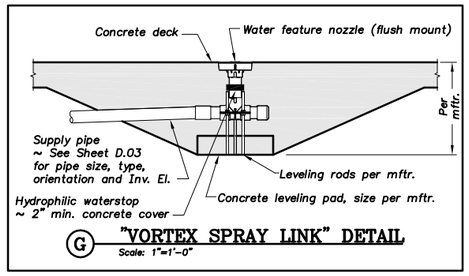
E "VORTEX ABOVE GRADE SPRAY" DETAIL
Scale: 1"=1'-0"



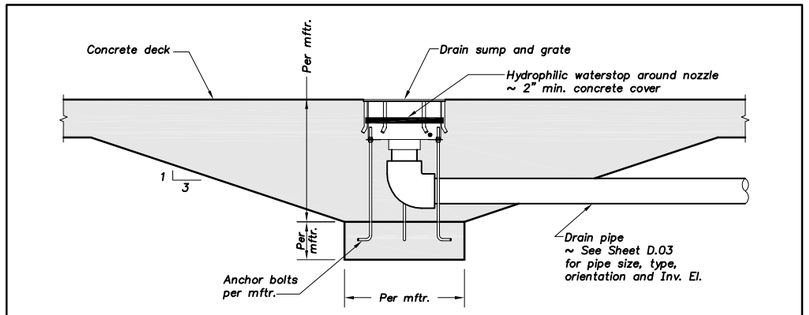
B DECK DRAIN – TRENCH DETAIL
Scale: 1"=1'-0"



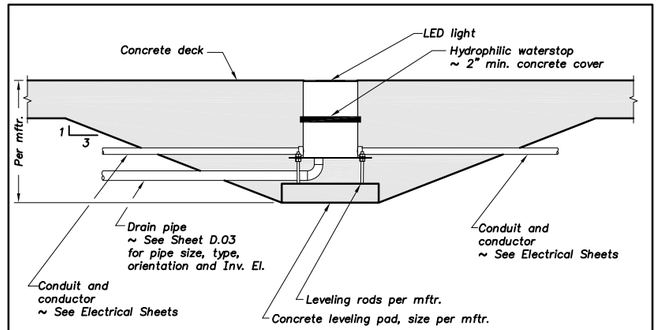
F "VORTEX FLUSH MOUNT SPRAY" DETAIL
Scale: 1"=1'-0"



G "VORTEX SPRAY LINK" DETAIL
Scale: 1"=1'-0"



C "WATER ODYSSEY DECORATIVE DRAIN" DETAIL
Scale: 1"=1'-0"



H "VORTEX LED LIGHT" DETAIL
Scale: 1"=1'-0"

LAP LENGTH SCHEDULE

BAR SIZE	LAP LENGTH	HOOK LENGTH
#3	19"	7"
#4	26"	10"
#5	31"	12"
#6	37"	15"
#7	54"	17"
#8	62"	19"

NOTES:
1. Bar lap length of smaller diameter bar shall be used when splicing different size bars.
2. Lap splices shall be wired in contact.
3. Tabulated values are based on 4000 psi, normal weight concrete with Grade 60 reinf.

CONCRETE PROTECTION FOR REINFORCEMENT

CONDITION	MIN. COVER (INCHES)
Concrete cast against and permanently exposed to earth, subgrade, or granular fill	3"
Formed or top surfaces exposed to weather, submerged, or in contact with earth, including stirrups, ties, or spirals	2"
Formed concrete not exposed to earth, liquids, or weather:	
Slabs, walls, and joists	1½"
Beams and columns primary reinforcement, ties, stirrups, and spirals	1½"

NOTES:
1. The above minimum concrete cover shall be provided for reinforcement unless noted otherwise.
2. Placing reinforcement tolerances:
   a. For members less than or equal to 8"
      Tolerance = (±⅜")
   b. For members greater than 8"
      Tolerance = (±½")

GENERAL SHEET NOTES

1. All El.'s shown (–)x.xx', are distances down from indicated Water El.
2. All El.'s shown (+)x.xx', are distances up from indicated Water El.
3. Form savers may be used at Contractor's option
4. Hold waterstop 1½" clear Min. from reinforcing. Tie to reinforcing/tie rod @ 6" O.C.
5. All form ties shall be 1½" deep, cone snap type

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CITY OF MARSHALLTOWN, IOWA
MEGA-10 PARK WATER PLAZA
WATER PLAZA MECHANICAL DETAILS

SHEET D.04

FILTER AREA KEY NOTES

1. 12" Min. depth of structural fill
2. Filter fabric between structural fill/existing subgrade, and entirely encase granular fill
3. 12" Min. depth of granular fill
4. General fill
5. Precast wet pit with watertight pipe penetrations
6. 42" x 42" Access hatch with concrete infill
7. Manhole steps at 12" with ladder extension
8. 12" Diameter x 7" deep sump
9. Sump pump for wet pit ~ Install in wet pit only as needed during offseason ~ 1½" Discharge pipe with ball valve to 90 degree drain elbow ~ Quick connect between sump pump piping and discharge piping
10. Low water cut-off float switch and baffle ~ Set cut-off at 18" above wet pit bottom ~ See Detail C-D.08
11. Spray ground drain pipe to wet pit
12. Butterfly valve with lever operator up high in wet pit for off-season water diversion to storm sewer ~ Valve normally open, closed for off-season
13. Off-season water diversion pipe
14. Butterfly valve with lever operator up high in valve box (or provide T-handle) for off-season water diversion to storm sewer ~ Valve normally closed, open for off-season
15. 4" Offseason sump pump 90 degree drain elbow with cap ~ Remove cap for off-season ~ Set rim at El. 887.00
16. Off-season water diverter and wet pit drain pipe to manhole on Sheet M.01
17. 3" Recirc pump suction ~ 90 degree elbow down ~ Provide foot check valve, screen, and drain valve
18. Piping routed below slab / grade
19. Recirc pump with integral basket strainer on concrete base, valves on suction and discharge, and gauges on suction and discharge ~ 3" suction and 3" discharge ~ Flowmeter on pump discharge
20. 3" Recirc pump discharge/filter influent
21. 2'-6" Diameter fiberglass filter with multiport valve, air release valve, and filter pressure gauge
22. 3" Filter effluent/recirc pipe
23. Recirc/backwash isolation valve
24. Connection to chemical controller
25. 3" Connection to UV with isolation valve
26. UV cylinder on concrete pad
27. UV controller on FRP strut supports
28. Inline strainer
29. 3" Connection from UV with isolation valve
30. UV bypass valve (normally closed)
31. Recirc throttling valve
32. Connection from muriatic acid feeder
33. Connection from sodium hypochlorite feeder
34. 3" Recirc effluent, discharge near water feature pump suction
35. 3" Filter backwash discharge with ball valve for throttling ~ Route pipe to funnel with 12" air gap
36. 4x6 Reducer funnel
37. 4" Drain pipe from filter area to backwash pit
38. Horizontal backwater valve
39. Precast backwash pit
40. Manhole ring and painted lid
41. Manhole steps at 12"
42. Grout 10" to 12" and provide sump at inverted drain tee
43. Inverted drain tee with blind flange on end
44. 4" Drain pipe from backwash pit to lift station
45. Lift station ~ See Sheet M.05
46. Chemical controller ~ See Detail A-D.08
47. Sodium hypochlorite feeder ~ See Detail B-D.08
48. Sodium hypochlorite drum ~ By Owner (N.I.C.)
49. Muriatic acid feeder ~ See Detail B-D.08
50. Muriatic acid drum ~ By Owner (N.I.C.)
51. Emergency shower/eye wash provided with tepid water per OSHA ~ See MEP Sheets
52. 2" Water supply to spray ground system ~ See MEP Sheets
53. Isolation valve and backflow preventer
54. 1" Water supply with isolation ball valve to Glo Mist Nano (city water)
55. 2" wet pit water fill with isolation ball valve ~ Provide 12" air gap at fill funnel
56. 1" wet pit water make-up with isolation ball valve, water level control solenoid valve, and water meter ~ Provide 12" air gap at fill funnel
57. 4" Water fill and water make-up standpipe to wet pit ~ Extend 48" above floor and provide 4x6 reducer for fill funnel
58. 2" Water make-up sensor standpipe to wet pit ~ Extend top of standpipe to 48" above floor and provide water level control sensor ~ Set water make-up at 24" above wet pit bottom
59. Water level control box
60. 4" Water feature pump suction adjacent to filter/recirc effluent ~ 90 degree elbow down ~ Provide foot check valve, screen, and drain valve
61. Water features – Zone 1 pump with integral basket strainer on concrete base, valves on suction and discharge, and gauges on suction and discharge ~ 1" suction and 1" discharge ~ Flowmeter on pump discharge
62. Water features – Zone 2 pump with integral basket strainer on concrete base, valves on suction and discharge, and gauges on suction and discharge ~ 1" suction and 1" discharge ~ Flowmeter on pump discharge
63. Water features – Zone 3 pump with integral basket strainer on concrete base, valves on suction and discharge, and gauges on suction and discharge ~ 2" suction and 2" discharge ~ Flowmeter on pump discharge
64. Water features – Zone 4 pump with integral basket strainer on concrete base, valves on suction and discharge, and gauges on suction and discharge ~ 4" suction and 4" discharge ~ Flowmeter on pump discharge
65. Electrical note ~ Feature pumps shall not operate if recirc pump is off
66. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
67. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
68. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
69. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
70. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
71. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
72. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
73. 1" Water supply to Leaper – Directional Jet No. 3 ~ Ball valve and solenoid valve
74. 2" Water supply to Jet Stream No. 2 ~ Ball valve and solenoid valve
75. 1" Water supply to Glo Mist Nano (city water) ~ Ball valve and solenoid valve
76. 3" Water supply to Wave ~ Ball valve and solenoid valve
77. 3" Water supply to Wave ~ Ball valve and solenoid valve
78. 1" Water supply to Glo Mist Nano (city water) ~ Ball valve and solenoid valve
79. 1" Water supply to Spray Link No. 1 ~ Ball valve and solenoid valve
80. 1" Water supply to Spray Link No. 1 ~ Ball valve and solenoid valve
81. 1" Water supply to Spray Link No. 1 ~ Ball valve and solenoid valve
82. Water feature controller, lighting controller, and power source
83. Water feature rain and wind sensor
84. 1" Drain pipe and ball valve to wet pit

PUMP DATA								
Spray Ground Pump Description	Flow (gpm)	TDH (ft.)	TDH (psi)	Shut-off Head (max.) (ft.)	Efficiency +/- 5%	HP	RPM	VFD
Recirc	100	60	26	68	82	2	3,600	Integral Variable Speed
Water Features - Zone 1	16	30	13	45	72	0.75	3,600	Integral Variable Speed
Water Features - Zone 2	16	30	13	45	72	0.75	3,600	Integral Variable Speed
Water Features - Zone 3	40	30	13	48	74	1	3,600	Integral Variable Speed
Water Features - Zone 4	205	35	15	55	76	5	3,600	Integral Variable Speed

FILTER DATA												
Location	Volume (gallons)	Recirc Rate (GPM)	Filter Size (dia.) (ft.)	Quantity or Cells	Filter Area Each (s.f.)	Filter Area Total (s.f.)	Filter Loading Rate (gpm/s.f.)	Average Turnover (hours)	Backwash Rate at 15 gpm*s.f. (gpm)	Backwash Time (minutes)	Backwash Volume Each (gal.)	Backwash Volume Total (gal.)
Spray Ground	3,000	100	2.50	2	4.91	9.81	10.19	0.50	74	5	368	736

MAXIMUM PIPE SUPPORT SPACING (Feet) **				
Pipe Size	Sch 80 PVC	Ductile Iron	Copper (L&K)	
½"	4.5	–	5.0	
¾"	4.5	–	5.0	
1"	5.0	–	6.0	
1¼"	5.0	–	7.0	
1½"	5.5	–	8.0	
2"	6.0	–	8.0	
2½"	6.0	–	9.0	
3"	7.0	–	10.0	
4"	7.5	*	12.0	
5"	–	–	13.0	
6"	9.0	*	14.0	
8"	9.5	*	16.0	
10"	10.0	*	18.0	
12"	11.5	*	19.0	
14"	–	*	–	
16"	–	*	–	

* Maximum support spacing of 20 Ft. Provide a minimum of 1 hanger as close as practical to the joint behind the bell, and at changes of direction and branch connections.

** Unless shown or noted otherwise

PIPING NOTES

1. Pipe type shall be Sch 80 PVC unless noted otherwise
2. All pumps to be mounted to concrete pads, and pumps shall be removable
3. Refer to Pool Mechanical Sheets for pipe types beyond the building
4. Pipe sizes are identified in inches on the drawings
5. Pipe connection hardware shall be S.S. within Pool Mechanical Room
6. Contractor shall provide and install uniflanges/unions as req'd
7. Sch 80 PVC fittings may be solvent weld or flanged at Contractor's option
8. All piping and fittings at equipment (filters, pumps, valves, etc.) shall be flanged ~ PVC flanges at fittings shall be male type as shown
9. Refer to Maximum Pipe Support Spacing Schedule for frequency and spacing of pipe supports ~ At minimum, Contractor shall support piping as indicated on schedule which may require more supports than indicated on drawings
10. All pipe supports shall be 316 S.S. or FRP
11. All hardware shall be S.S.
12. Provide air release valve at all high loops in piping
13. All piping shall slope to drain by gravity
14. Provide drain valve at all low points in piping
15. Provide drain valve at normally closed solenoid valve or check valve, or provide true unions, to allow for winter drainage
16. All piping through concrete structures shall be cast-in-place ~ No pipe sleeves or coring allowed
17. Provide compound pressure gauge on all pump suctions
18. Provide pressure gauge on all pump discharges
19. All piping and conduit shall be mounted along wall, ceiling, etc. (not in foot traffic)

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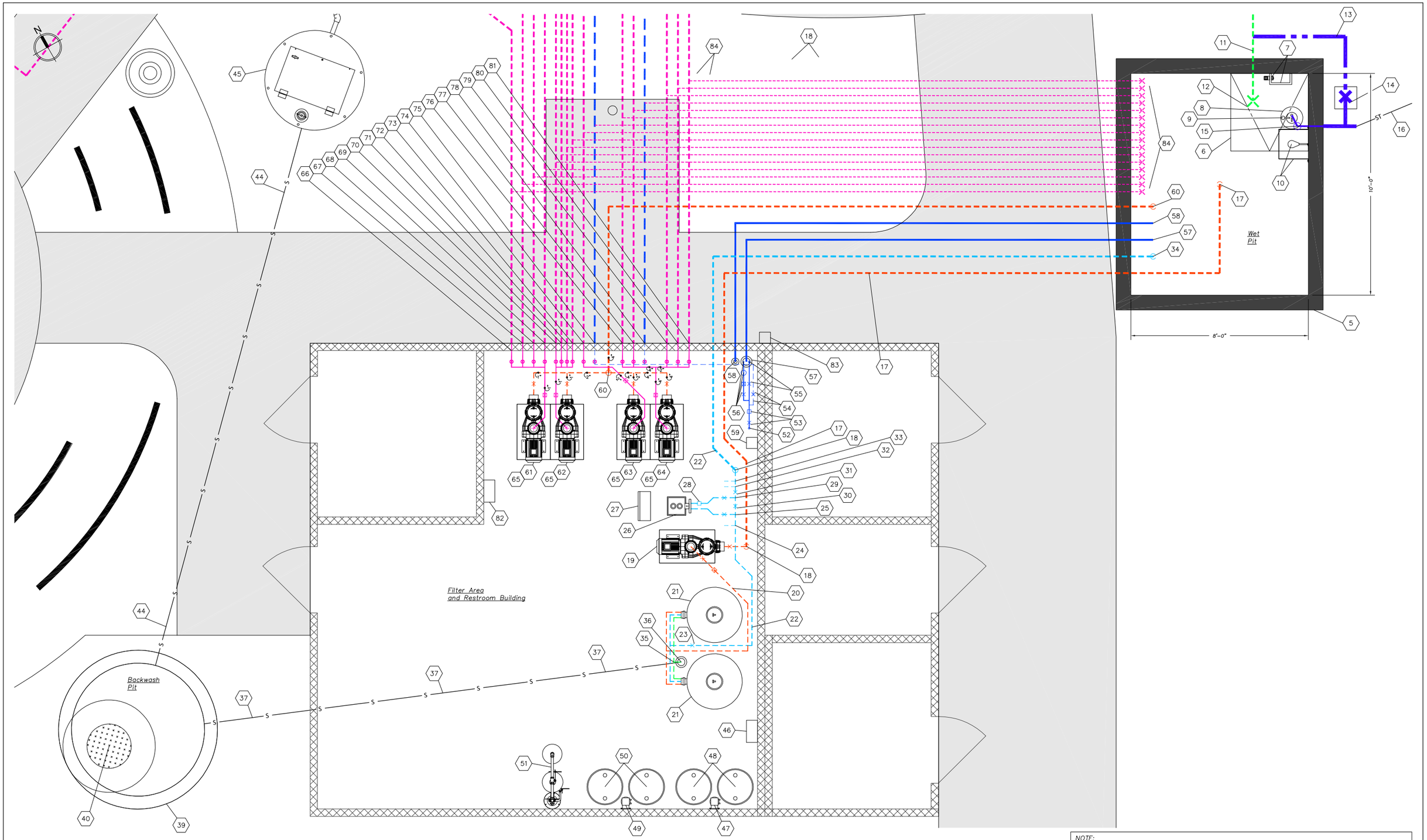
CITY OF MARSHALLTOWN, IOWA

MEGA-10 PARK WATER PLAZA

FILTER AREA KEY NOTES AND DATA

SHEET D.05



A FILTER AREA PLAN
Scale: 1/2=1'-0"

NOTE:
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CITY OF MARSHALLTOWN, IOWA
MEGA-10 PARK WATER PLAZA
FILTER AREA PLAN

SHEET D.06

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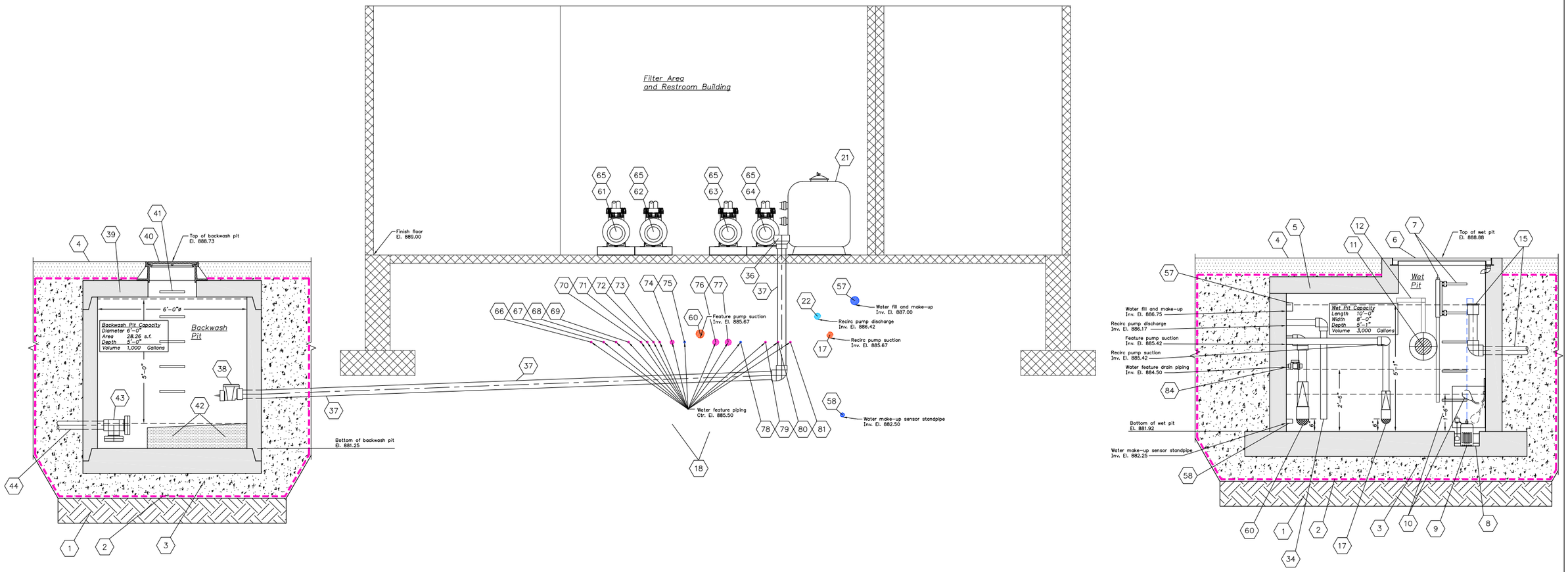

0 1' 2' 4' 6'
½" = 1'-0"

A FILTER AREA SECTION
Scale: ½=1'-0"

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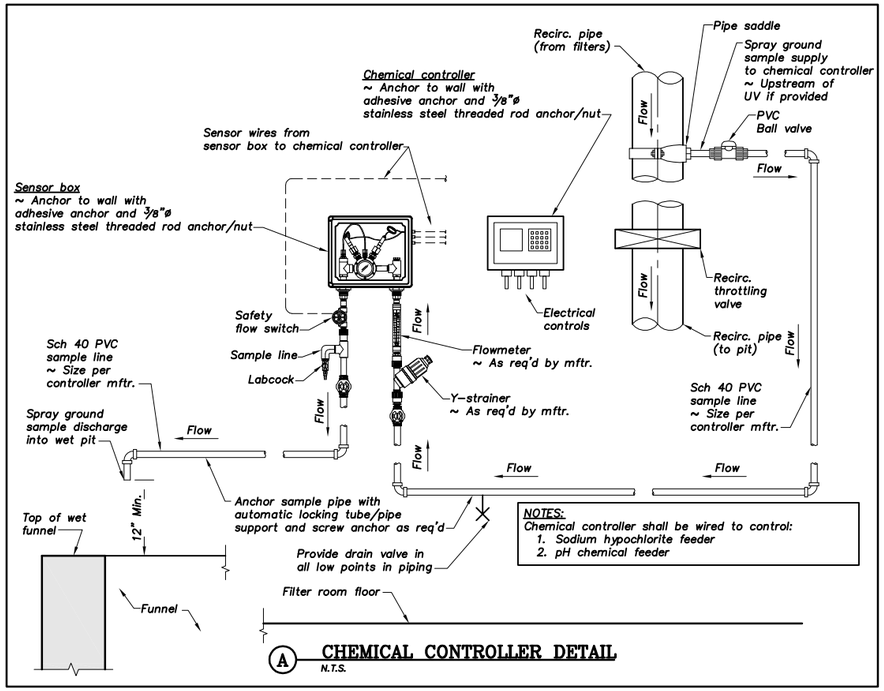
CITY OF MARSHALLTOWN, IOWA
MEGA-10 PARK WATER PLAZA
FILTER AREA SECTION

SHEET
D.07



A CHEMICAL CONTROLLER DETAIL
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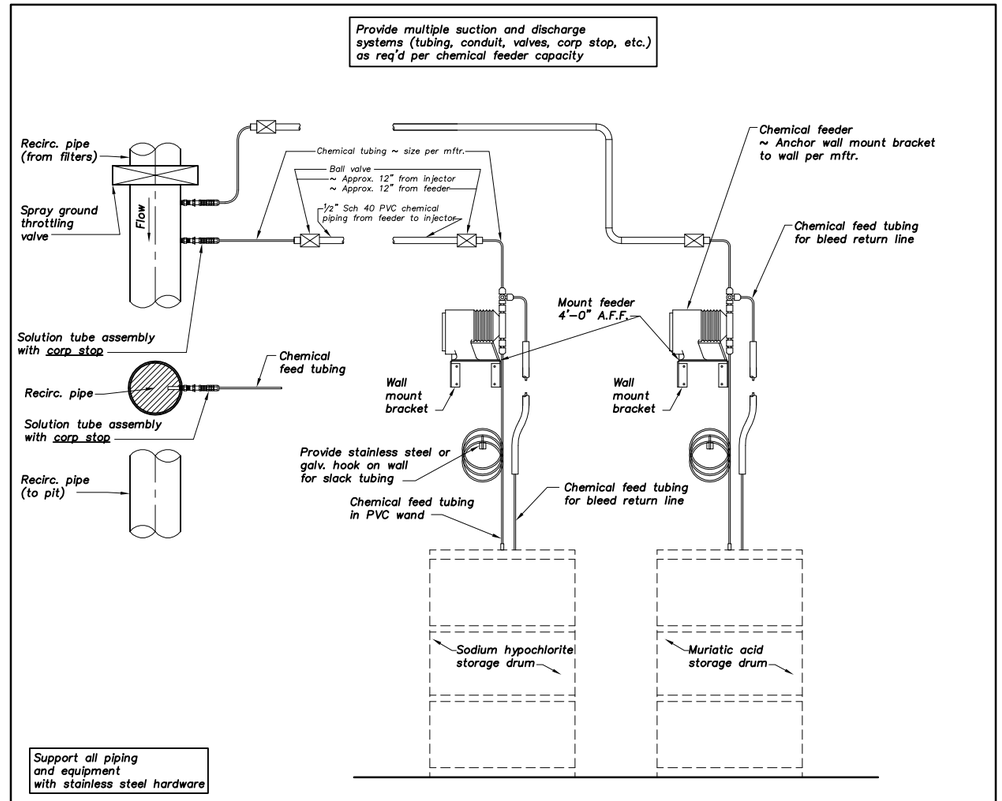
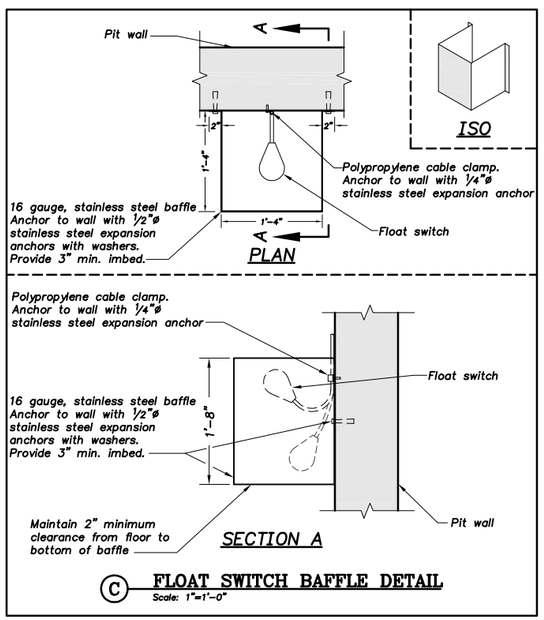


B SODIUM HYPOCHLORITE AND MURIATIC ACID FEED SYSTEM DETAIL
N.T.S.



C FLOAT SWITCH BAFFLE DETAIL
Scale: 1"=1'-0"

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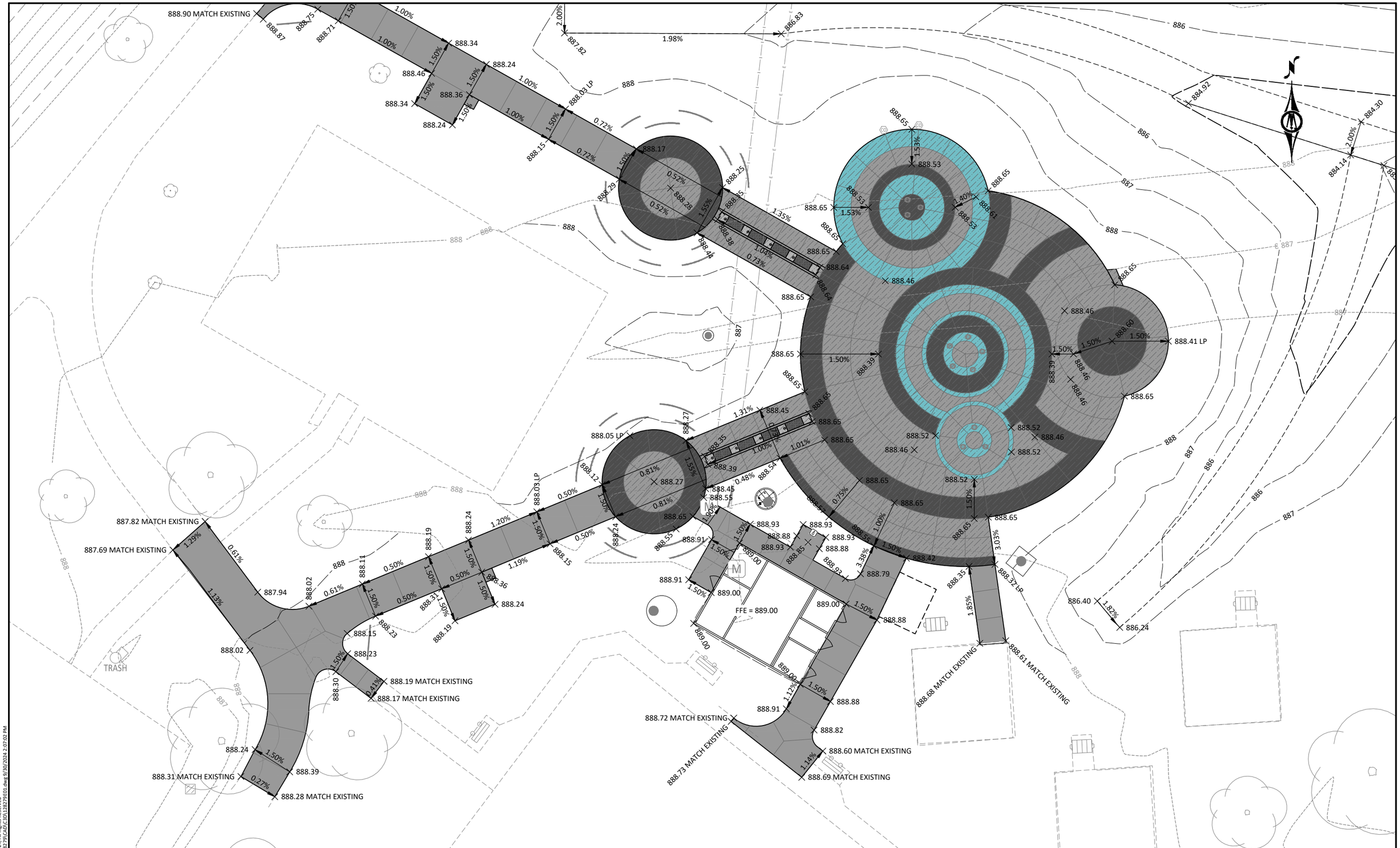
CITY OF MARSHALLTOWN, IOWA
MEGA-10 PARK WATER PLAZA
FILTER AREA DETAILS

SHEET
D.08



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SCALE FEET

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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

GRADING

SHEET E.01

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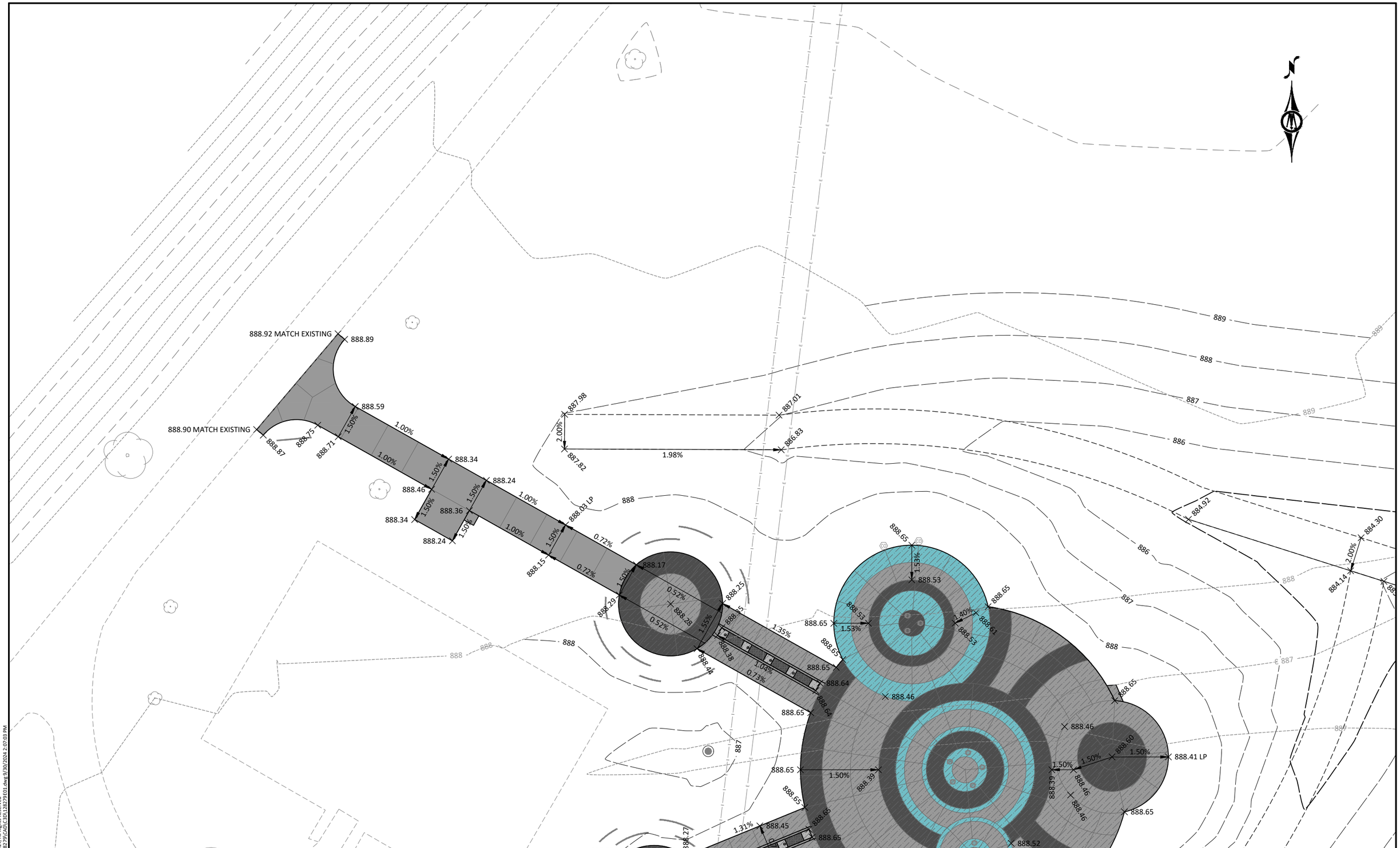

HORZ. SCALE 0 10 20 FEET

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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

GRADING

SHEET E.02

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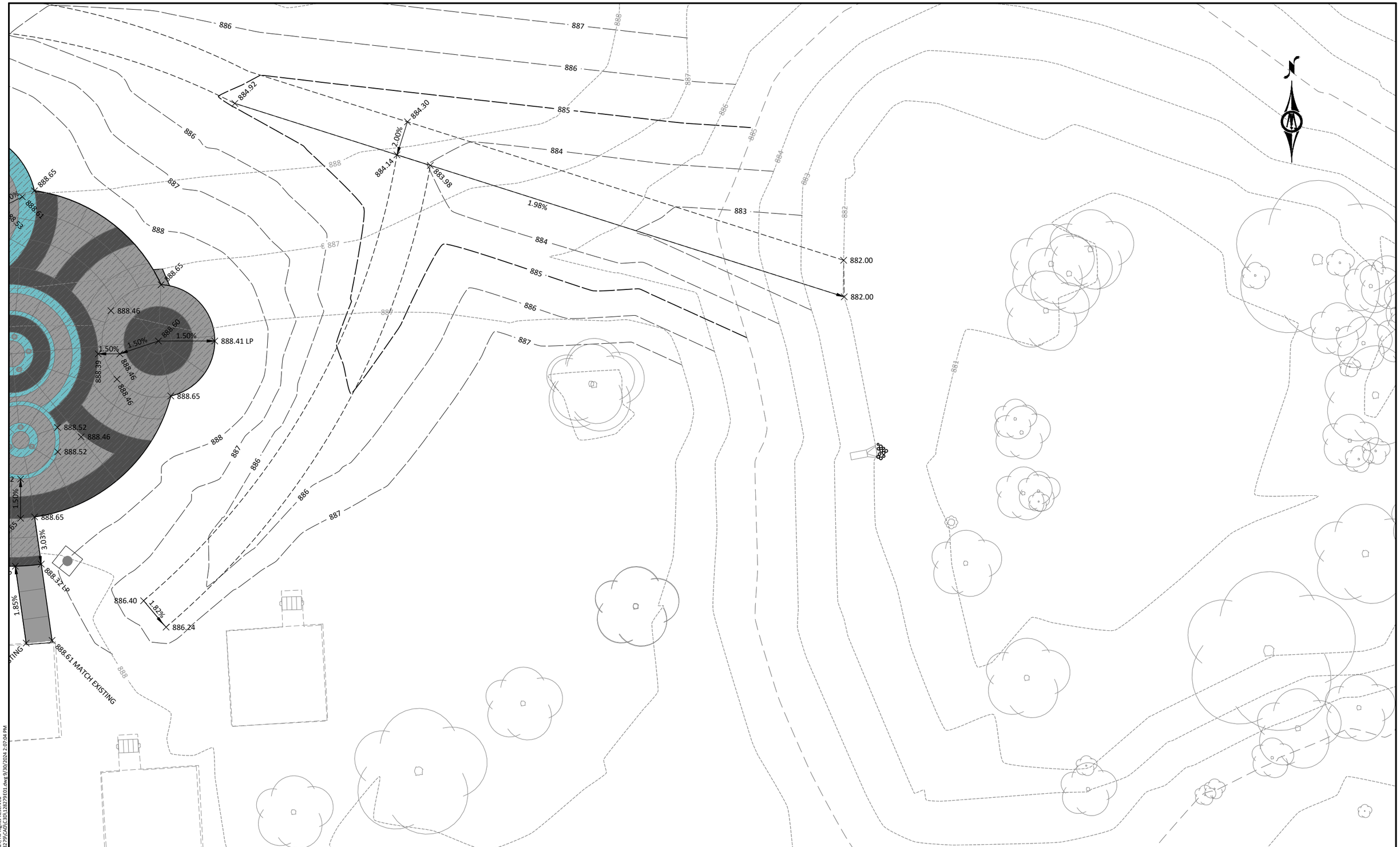

HORZ. 0 10 20
SCALE FEET

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REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
GRADING

SHEET
E.03

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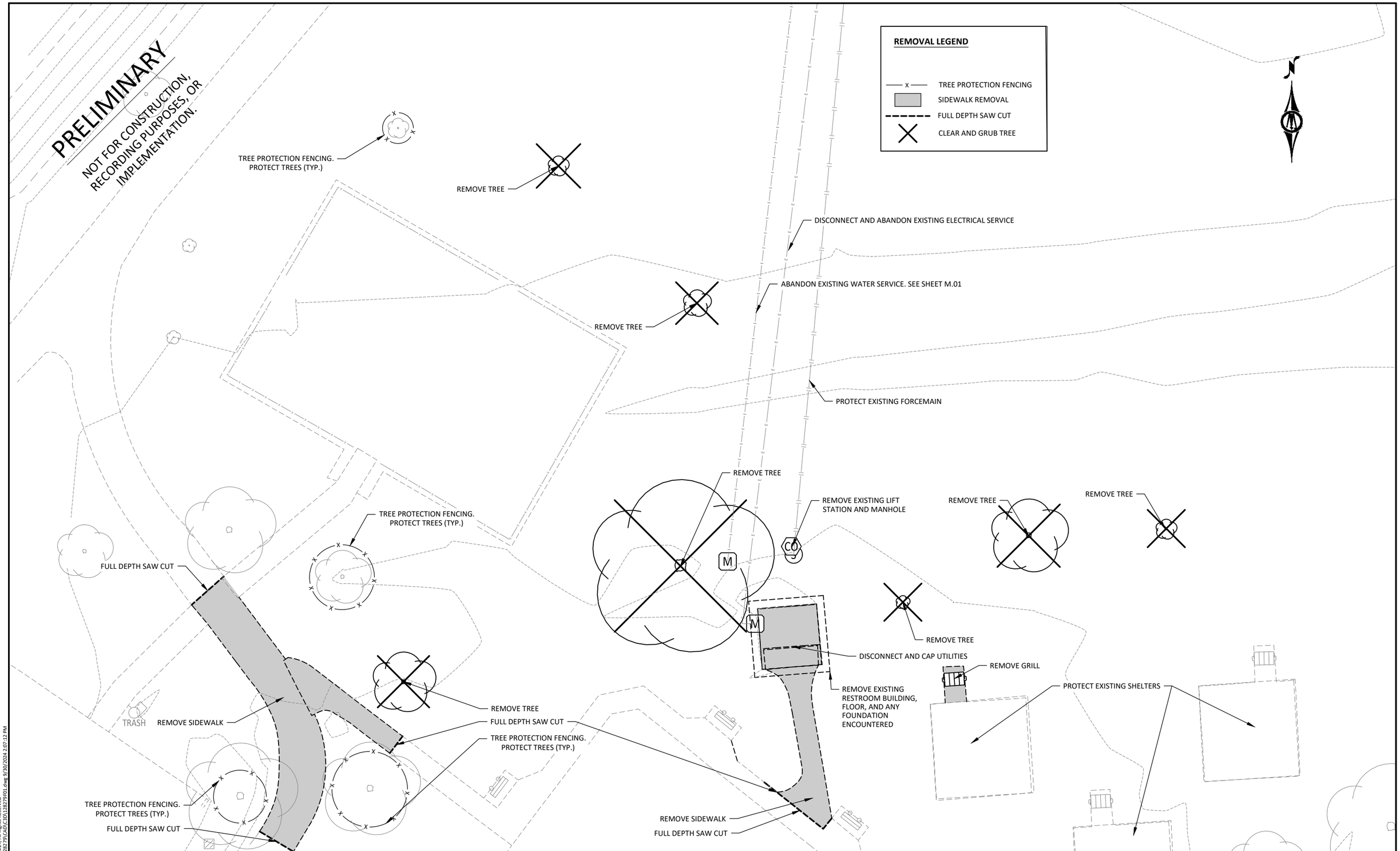

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SCALE FEET

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CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
EXISTING CONDITIONS + REMOVALS

SHEET
F.01

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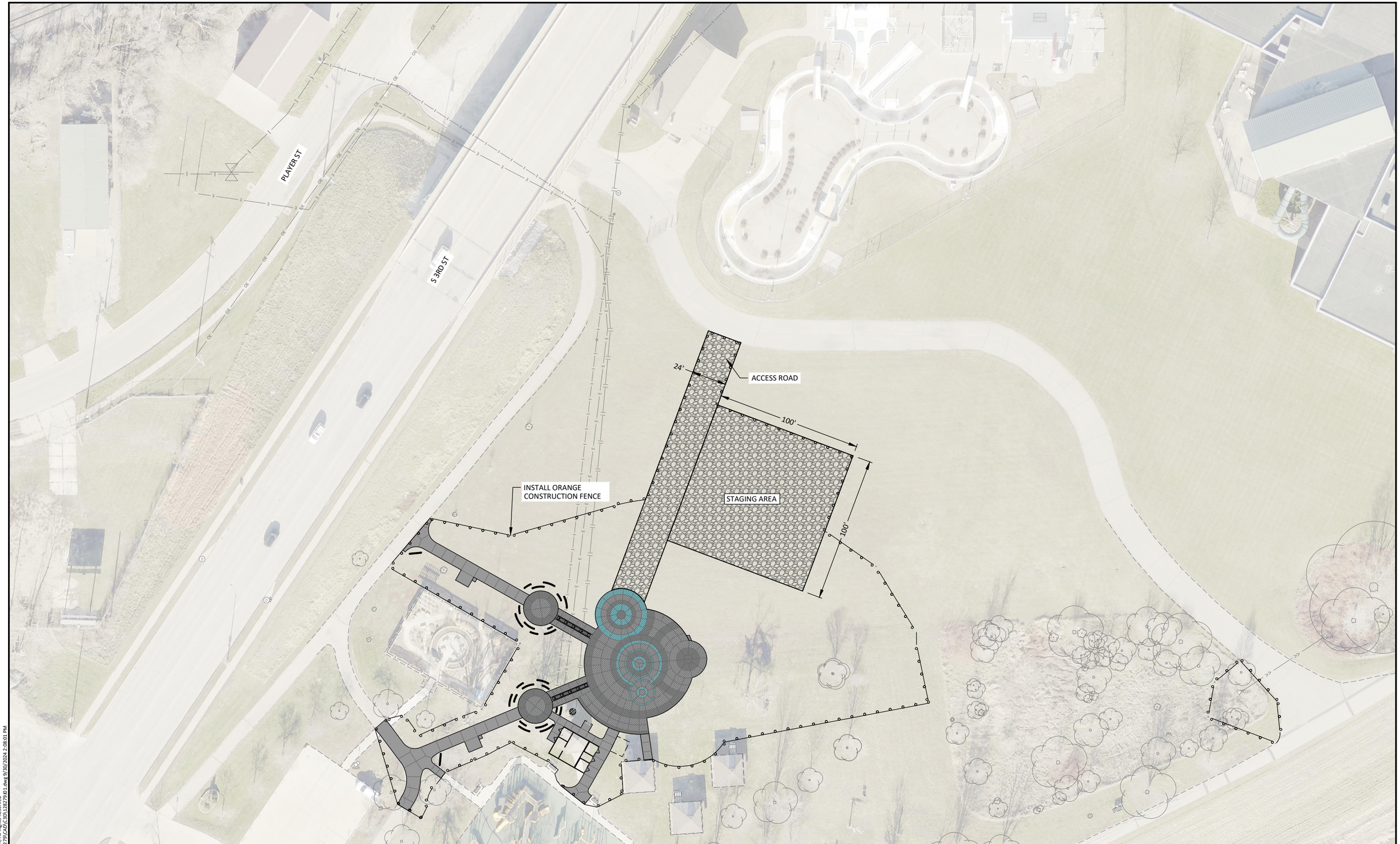

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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

STAGING PLAN

SHEET J.01

LEGEND:

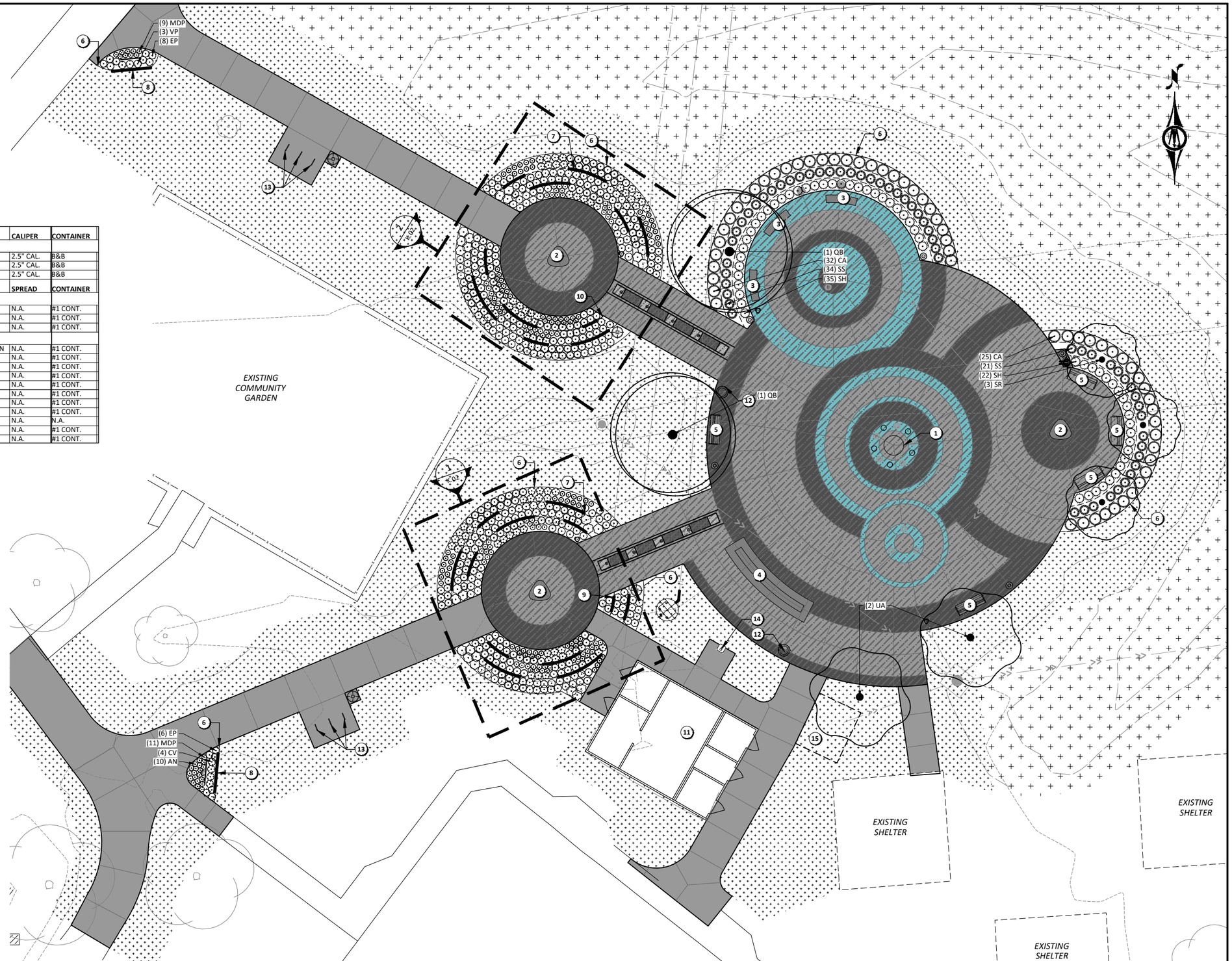
TYPE 1 SEED

TYPE 1 S0D

CODE	QTY	BOTANICAL NAME	COMMON NAME	CALIPER	CONTAINER
CANOPY TREES					
QB	2	QUERCUS BICOLOR	SWAMP WHITE OAK	2.5" CAL.	B&B
SR	3	SYRINGA RETICULATA 'IVORY SILK'	IVORY SILK JAPANESE TREE LILAC	2.5" CAL.	B&B
UA	2	ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM	2.5" CAL.	B&B
CODE	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SPREAD**	**CONTAINER**
ORNAMENTAL GRASSES					
CA	57	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	KARL FOERSTER GRASS	N.A.	#1 CONT.
SS	55	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	N.A.	#1 CONT.
SH	56	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	N.A.	#1 CONT.
PERENNIALS					
AP	86	ALLIUM X 'PURPLE SENSATION'	PURPLE SENSATION ORNAMENTAL ONION	N.A.	#1 CONT.
AT	22	ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	N.A.	#1 CONT.
AN	87	ASTER NOVAE-ANGLIAE 'PURPLE DOME'	NEW ENGLAND ASTER	N.A.	#1 CONT.
CG	72	COREOPSIS GRANDIFLORA	TICKSEED	N.A.	#1 CONT.
CV	81	COREOPSIS VERTICILLATA	WHORLEDTICKSEED	N.A.	#1 CONT.
EP	83	ECHINACEA PURPUREA 'PAS702917'	POWWOW® WILD BERRY CONEFLOWER	N.A.	#1 CONT.
EC	58	ECHINACEA X 'CANTALOUPE'	SUPREME™ CANTALOUPE CONEFLOWER	N.A.	#1 CONT.
MDP	20	MONARDA DIDYMA 'PARDON MY PINK'	PARDON MY PINK BEE BALM	N.A.	#1 CONT.
PP	25	PHLOX PANICULATA 'BARTHIRTYONE'	VOLCANO® RUBY GARDEN PHLOX	N.A.	N.A.
RA	74	RUDBECKIA FULGIDA 'GOLDSTRUM'	BLACK-EYED SUSAN	N.A.	#1 CONT.
SN	50	SALVIA NEMOROSA 'MAY NIGHT'	MAY NIGHT MEADOW SAGE	N.A.	#1 CONT.

SITE FURNISHING KEYNOTES:

1. SCULPTURE FOOTING (SEE STRUCTURAL SHEETS)
2. CONC PEBBLE (SEE SHEET B.03)
3. BENCH TYPE 1 (SEE SHEET B.03)
4. BENCH TYPE 2 (SEE SHEET B.03)
5. BENCH TYPE 3 (SEE SHEET B.03)
6. SPADE CUT EDGE (SEE SHEET B.02)
7. DECORATIVE METAL PANELS (SEE SHEET B.03)
8. SIGN TYPE 1 (SEE SHEET B.07)
9. SIGN TYPE 2 (SEE SHEET B.07)
10. SIGN TYPE 3 (SEE SHEET B.07)
11. RESTROOM (SEE SHEET B.08)
12. LITTER RECEPTACLE (SEE SHEET B.03)
13. BIKE RACK (SEE SHEET B.03)
14. FREE STANDING RINSE STATION (SEE SHEET B.04)
15. WET PIT



HORZ. 0 10 20 SCALE FEET

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CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
LANDSCAPING PLAN

SHEET K.01

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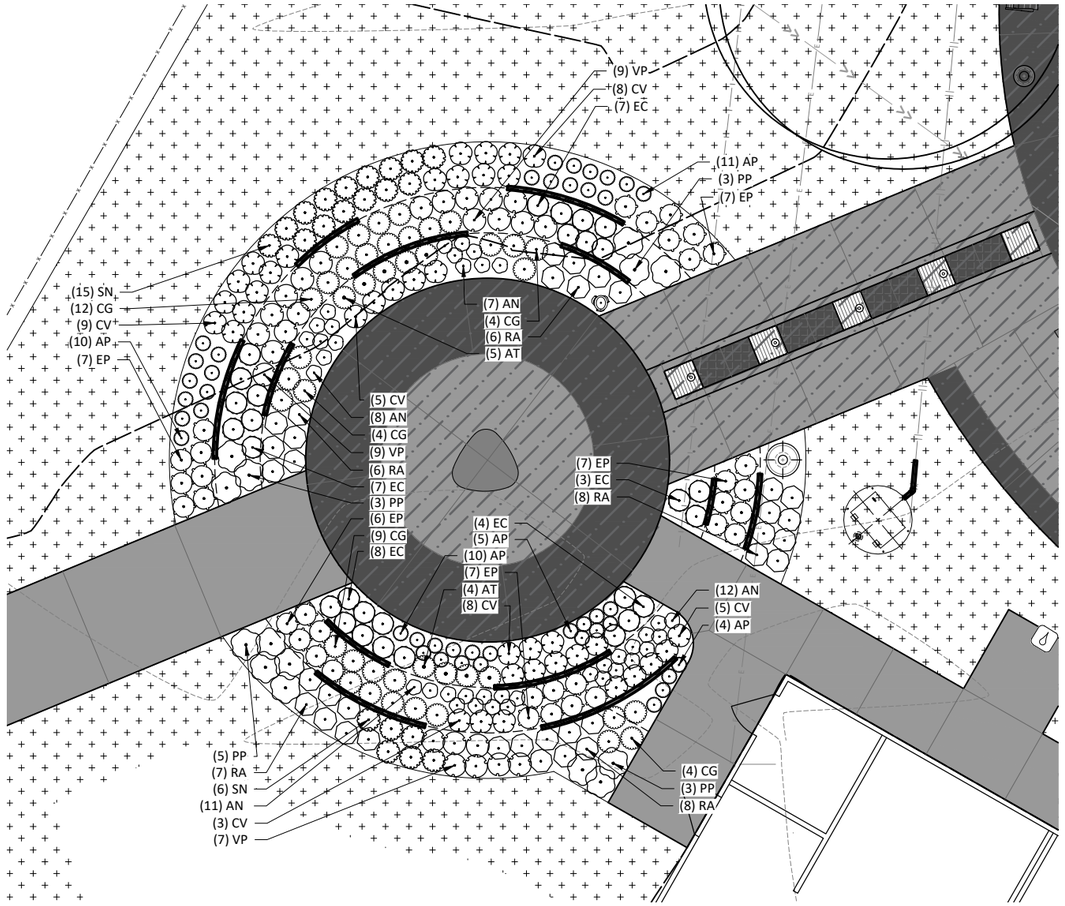
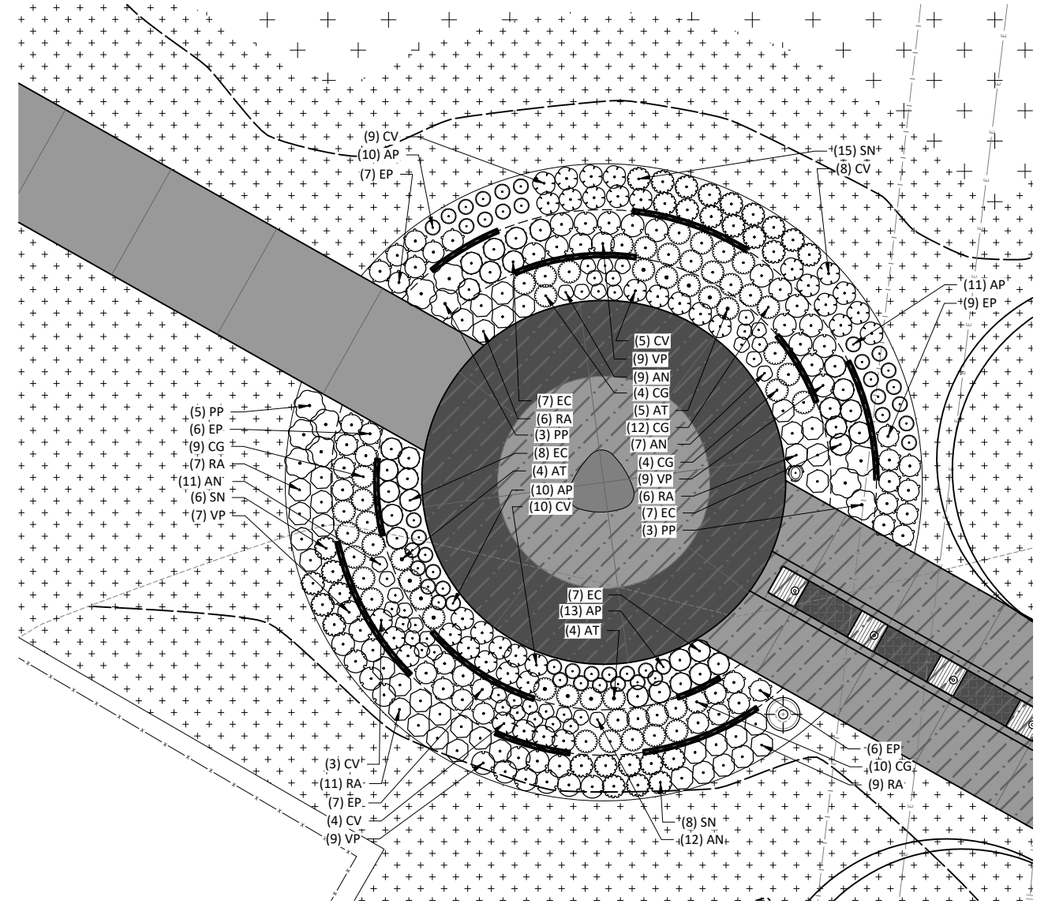


1 PLAN ENLARGEMENT: SOUTH-WEST LANDSCAPE LAYOUT
SCALE: N.T.S.



2 PLAN ENLARGEMENT: NORTH-WEST LANDSCAPE LAYOUT
SCALE: N.T.S.

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CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
LANDSCAPING PLAN

SHEET
K.02

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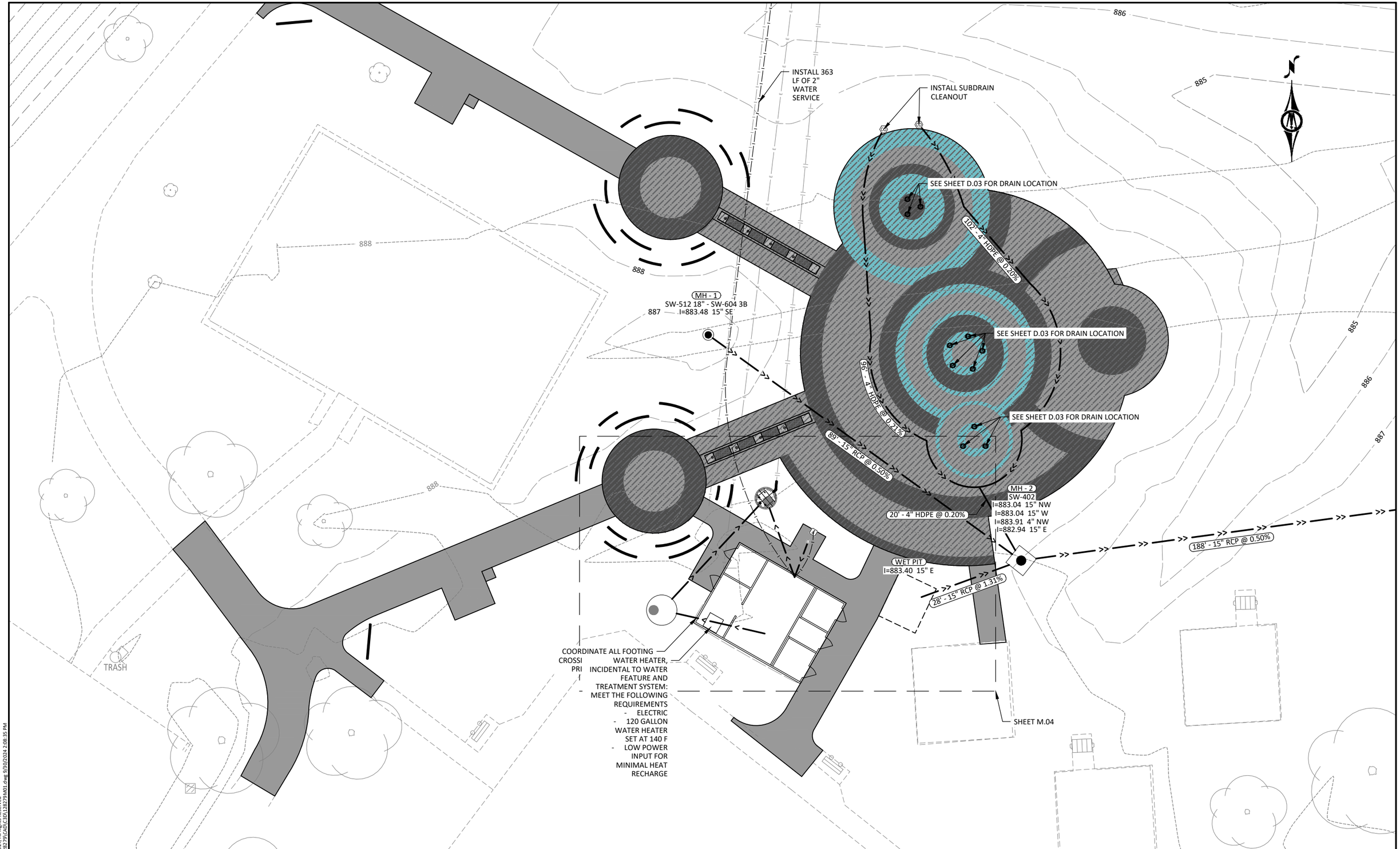

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CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
UTILITIES

SHEET
M.01

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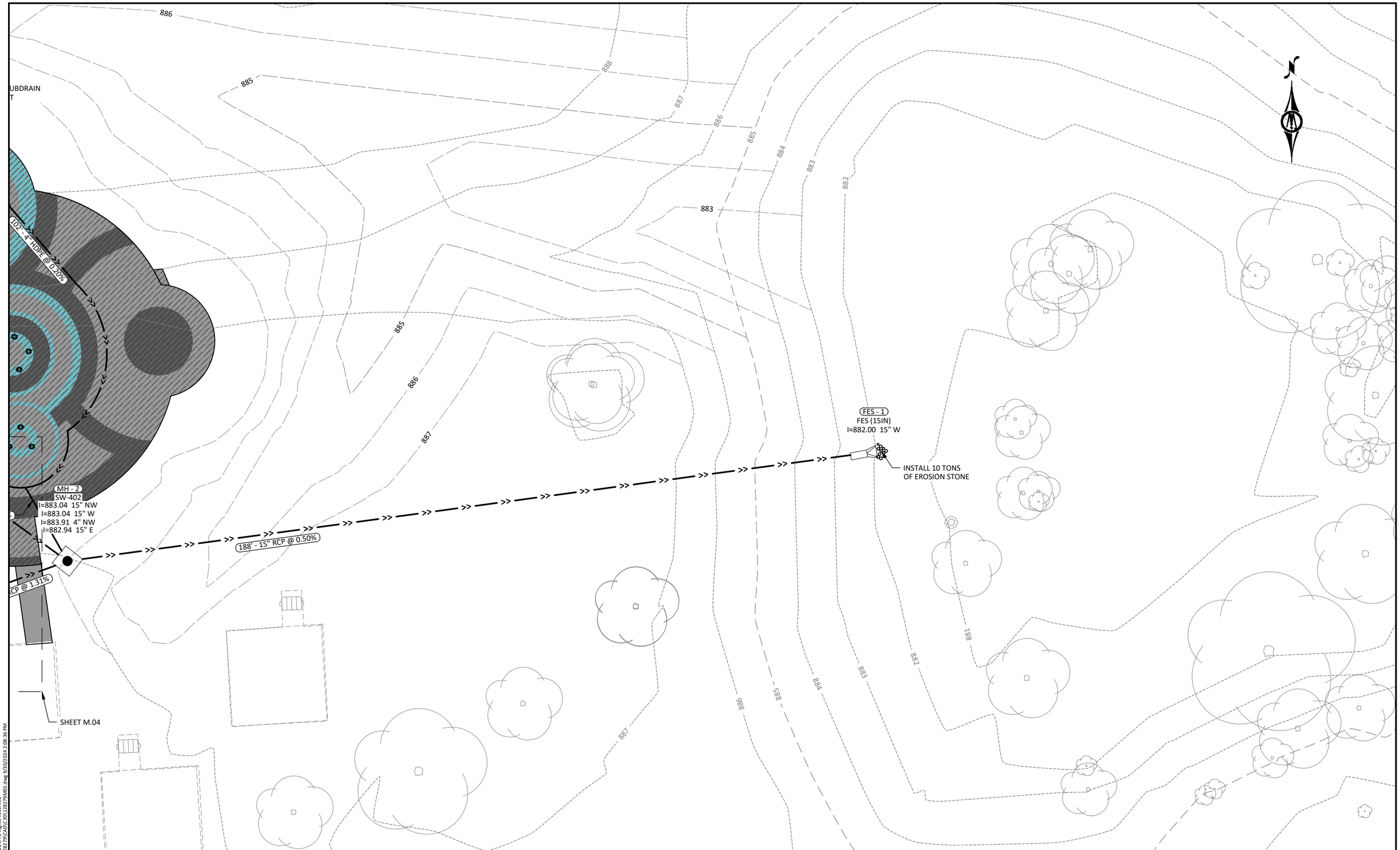

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WATER PLAZA AT MEGA-10 PARK

UTILITIES

SHEET M.02

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DISCONNECT EXISTING SERVICE AT THE MAIN COORDINATE WITH MARSHALLTOWN WATER WORKS ON DISCONNECT

INSTALL 2" TAPPING VALVE AND SLEEVE ON EXISTING 16" WATER MAIN

INSTALL 23 SY OF FULL DEPTH PATCH

BORE 230 LF OF 2" WATER MAIN

ABANDON EXISTING WATER SERVICE. REMOVE AS NEEDED FOR NEW 2" WATER SERVICE

2" WATER SERVICE

INSTALL 363 LF OF 2" WATER SERVICE

INSTALL WATER MAIN MANHOLE FOR SERVICE LINE DRAINAGE (SEE DETAIL)

PROTECT EXISTING FORCEMAIN

888 888 888 887 890 887 886 885 886 885 887 889

TEE SHALL BE THE LOWEST ELEVATION IN THE SERVICE LINE TO ALLOW LINE TO BE DRAINED IN THE WINTER

* NOTE: SERVICE TEE AND VALVE SHALL BE INCIDENTAL TO THE WATER MAIN MANHOLE

WATER MAIN MANHOLE DETAIL

SCALE: N.T.S.

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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

UTILITIES

SHEET M.03

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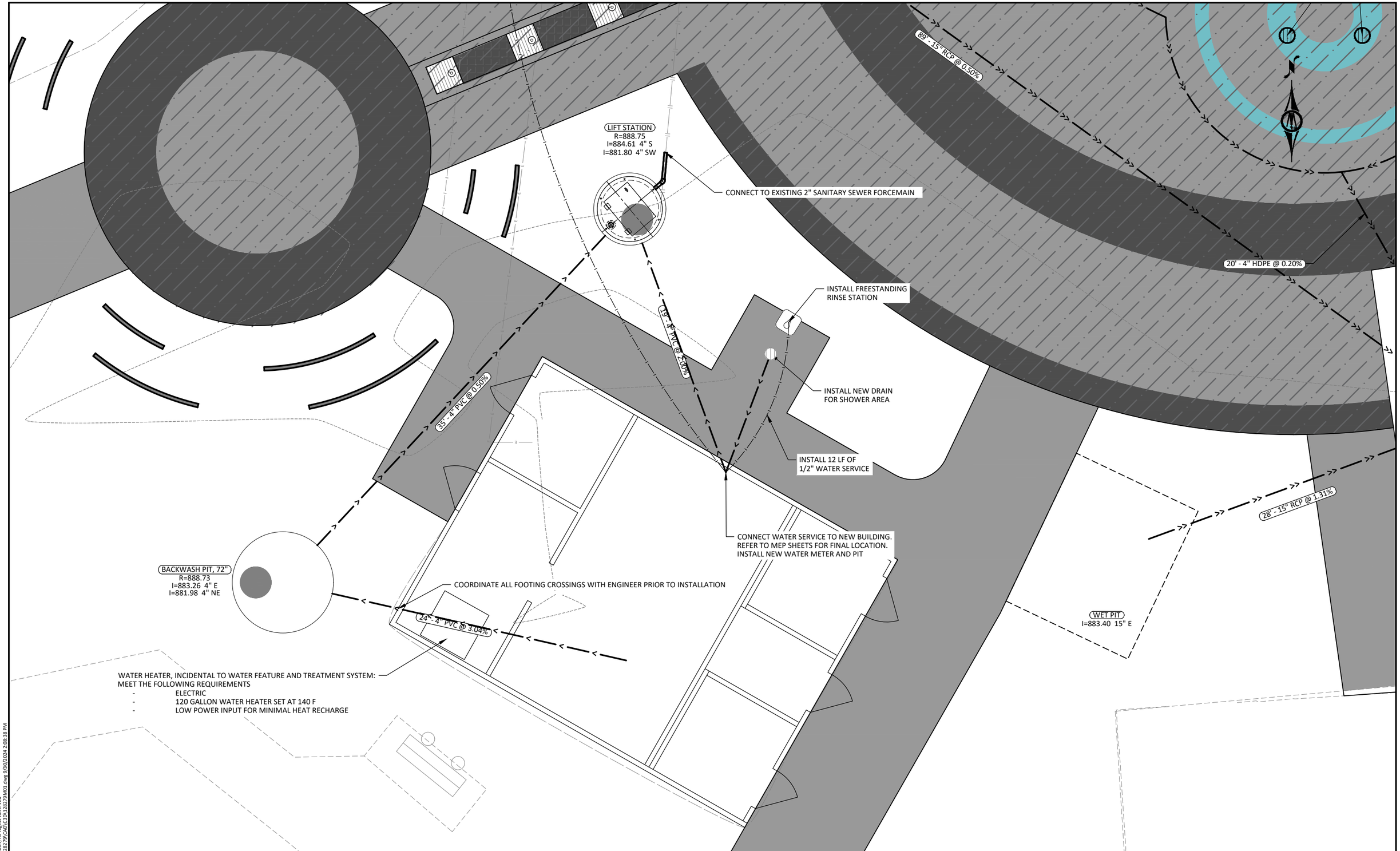

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CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

UTILITIES

SHEET M.04

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WATER PLAZA AT MEGA-10 PARK

UTILITIES

SHEET
M.05

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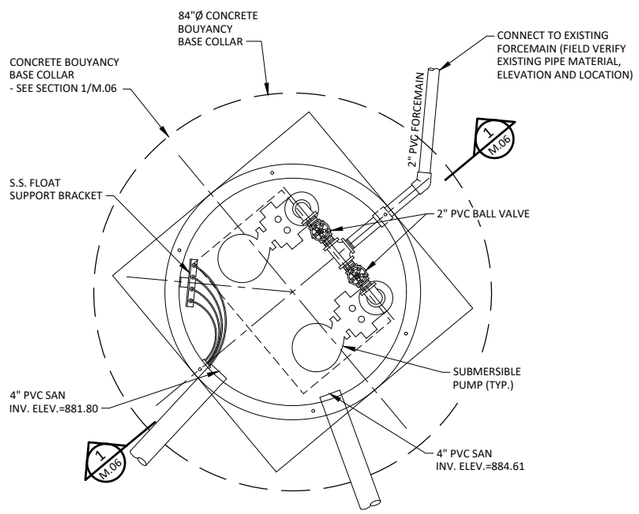
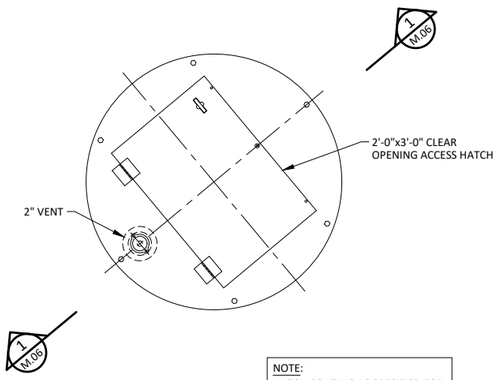


PLAN

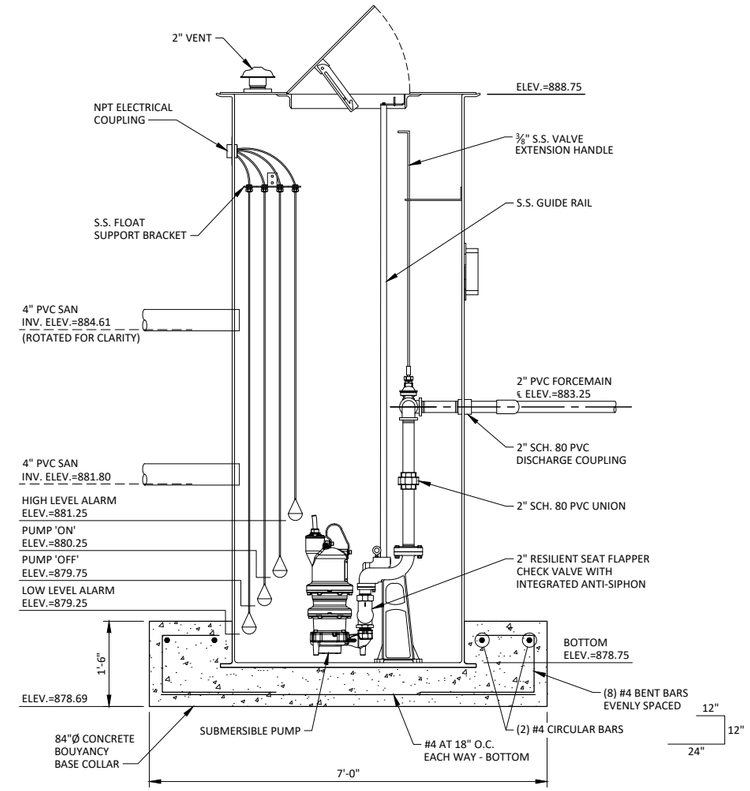
SCALE: 3/4"=1'-0"



NOTE:
HATCH COATING AS SPECIFIED FOR REFLECTION AND TO REDUCE HEAT. - SEE SECTION 33 32 16.

TOP PLAN

SCALE: 3/4"=1'-0"



1 M.06 SECTION

SCALE: 3/4"=1'-0"

Graphic Scale for 3/4"=1'-0"

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CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
UTILITIES - LIFT STATION

SHEET
M.06

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SCHEDULE GENERAL NOTES

SYMBOL	DESCRIPTION
(LSIG)	ELECTRONIC TRIP CIRCUIT BREAKER (LONG TIME, SHORT TIME, INST, GROUND FAULT)
(LSI)	ELECTRONIC TRIP CIRCUIT BREAKER (LONG TIME, SHORT TIME, INST)
(LSIA)	ELECTRONIC TRIP CIRCUIT BREAKER (LONG TIME, SHORT TIME, INST, GROUND FAULT ALARM)
(HL)	HANDLE LOCK
(SD)	DENOTES SERVICE DISCONNECT
(ST)	120V SHUNT TRIP OPERATOR
(G)	GROUND FAULT CIRCUIT INTERRUPTER
(E)	EXISTING BREAKER IN EXISTING PANEL
(N)	NEW BREAKER IN EXISTING PANEL
(NE)	NEW BREAKER, EXTEND EXISTING LOAD
(A)	ARC FLASH

GENERAL ELECTRICAL SYMBOLS

	CONNECTION TO MECHANICAL EQUIPMENT
J J	ELECTRICAL CONNCTION TO MISC EQUIPMENT
EPO #	EMERGENCY STOP PUSH BUTTON. REFER TO SCHEDULE FOR ADDITIONAL INFORMATION.
DPM	DIGITAL POWER METER, LCD DISPLAY, MONITORING OF VOLTAGE, CURRENT, POWER, PF, FREQUENCY, MIN/MAX AND AVERAGE VALUES, AND ENERGY
	PANELBOARD - SEE SCHEDULES FOR MORE INFORMATION
T. - UTIL	UTILITY TRANSFORMER - PROVIDED BY UTILITY
	SWITCHBOARD - SEE SCHEDULES FOR MORE INFORMATION
T	TRANSFORMER - SEE SCHEDULES FOR MORE INFORMATION
DS-XXX A/B/C	DISCONNECT SWITCH, HEAVY DUTY, SIZE INDICATED ON PLANS (A/B/C) WHERE A = RATING IN AMPS, B = NUMBER OF POLES, C = NEMA RATING (E.G. 1 = NEMA 1), XXX = NAME OF LOAD SERVED
M	POWER METER

GENERAL ELECTRICAL SYMBOLS

C.M.	CONSTRUCTION MANAGER
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING/PIPING CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
A.T.C.	AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR
G.C.	GENERAL CONTRACTOR
F.P.C.	FIRE PROTECTION CONTRACTOR
K.E.C.	KITCHEN EQUIPMENT CONTRACTOR
EQUIPMENT	SCHEDULED EQUIPMENT (UNDERLINED)
EQUIPMENT	NON-SCHEDULED EQUIPMENT
X_EQUIPMENT	EXISTING EQUIPMENT (X_ PREFIX)
A	6" ABOVE COUNTER OR BACKSPLASH TO CENTERLINE OF DEVICE
M	INSTALL DEVICE IN MILLWORK
XX	LOCATION-SPECIFIC MOUNTING HEIGHT ABOVE FINISHED FLOOR TO CENTERLINE OF DEVICE
H	INSTALL DEVICE HORIZONTALLY
B	BLACK DEVICE COLOR WITH BLACK UNBREAKABLE THERMOPLASTIC COVER PLATE
/	USED BETWEEN TWO OR MORE SUBSCRIPTS
# #	SECTION VIEW, TOP REPRESENTS DETAIL NUMBER, BOTTOM REPRESENTS SHEET NUMBER
# #	ENLARGED VIEW, TOP REPRESENTS VIEW NUMBER, BOTTOM REPRESENTS SHEET NUMBER

GENERAL LIGHTING SYMBOLS

SYMBOL	DESCRIPTION
	DOUBLE FACED EXIT SIGN
	SINGLE FACED EXIT SIGN
	RECESSED ARCHITECTURAL TROFFER
	RECESSED DOWNLIGHT
	EMERGENCY FIXTURE
	POLE MOUNTED SITE FIXTURE
	POLE MOUNTED SITE FIXTURE
	INDUSTRIAL FIXTURE
	SURFACE OR PENDANT LINEAR FIXTURE
	SURFACE OR PENDANT CIRCULAR FIXTURE
	WALL MOUNTED FIXTURE
	WALL SCONCE
	HIGH BAY

GENERAL SWITCH SYMBOLS

SYMBOL	DESCRIPTION
$	SWITCH,REFER TO SUBSCRIPT SCHEDULE FOR MORE INFORMATION.
D#	REFER TO SUBSCRIPT SCHEDULE FOR MORE INFORMATION
I#	REFER TO SUBSCRIPT SCHEDULE FOR MORE INFORMATION
U#	REFER TO SUBSCRIPT SCHEDULE FOR MORE INFORMATION

GENERAL POWER SYMBOLS

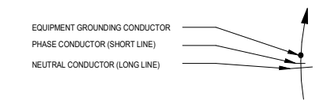
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE, NEMA 5-20R, EMERGENCY POWER
	DUPLEX RECEPTACLE, REFER TO SUBSCRIPT SCHEDULE FOR MORE INFORMATION.
CR	CORD REEL
CD	CORD DROP
	DOUBLE DUPLEX RECEPTACLE, NEMA 5-20R
	SIMPLEX RECEPTACLE, NEMA 5-20R
	SPECIAL RECEPTACLE
	RECESSED FLOOR BOX OR POKE-THRU
	DOUBLE DUPLEX RECEPTACLE, NEMA 5-20R, EMERGENCY POWER

GENERAL ELECTRICAL NOTES

1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH N.E.C., LOCAL, AND ALL OTHER APPLICABLE CODES.
2. INSTALLATION OF EQUIPMENT SHALL BE IN ACCORDANCE WITH CURRENT STANDARDS AND SPECIFICATIONS APPROVED BY THE AUTHORITY HAVING JURISDICTION (AHJ). PLACE ALL CABLE/WIRING IN CONDUIT OR RACEWAY UNLESS NOTED OTHERWISE. DO NOT LIE ON, OR SUPPORT CABLE FROM, CEILING DEVICES, PIPING OR DUCTWORK. PROVIDE NEW WIRING FOR ALL BRANCH CIRCUITS AND FEEDERS.
3. FEEDERS ON DRAWINGS ARE SCHEMATIC ONLY. CONDUIT RUNS SHALL COMPLY WITH CONDUIT SPECIFICATIONS AND CONTAIN BENDS THAT ARE NOT GREATER THAN 90 DEGREES. CONDUITS ABOVE GRADE SHALL BE RUN PARALLEL TO OR PERPENDICULAR WITH BUILDING LINES AND STRUCTURE.
4. ALL FEEDER AND BRANCH CIRCUITS TO PANELS, MOTORS, LIGHTS, RECEPTACLES, GENERAL DISTRIBUTION, ETC. SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR SIZED ACCORDING TO THE N.E.C. THE CONDUIT SYSTEM SHALL NOT BE CONSIDERED AN ACCEPTABLE GROUND.
5. REFER TO MECHANICAL EQUIPMENT SCHEDULES FOR DETAILED INFORMATION ON EQUIPMENT, DISCONNECTS, AND CONTROLS. E.C. SHALL PROVIDE ITEMS AS NOTED ON THE MECHANICAL SCHEDULES..
6. ALL WIRING AND FEEDER SIZES ON DRAWINGS ARE SIZED FOR COPPER WIRING UNLESS SPECIFICALLY NOTED OTHERWISE.

EQUIPMENT/DEVICE HOME RUN KEY

1. BRANCH CIRCUIT WIRING SHALL BE #12AWG UNLESS NOTED OTHERWISE ON THE PLAN OR IN THE SCHEDULES.
2. AS A MINIMUM USE 10 AWG CONDUCTOR FOR 20 AMPERE, 120 VOLT BRANCH CIRCUIT HOME RUNS LONGER THAN 100 FEET.
3. REFER TO SPECIFICATION SECTION 260519 FOR ADDITIONAL REQUIREMENTS.



LINE TYPE KEY

NEW WORK BY THE E.C. (DARK SOLID LINE)

NEW UNDERGROUND WORK BY THE E.C. (DARK DASHED LINE)

WORK BY OTHERS AND/OR EXISTING (LIGHT SOLID LINE)

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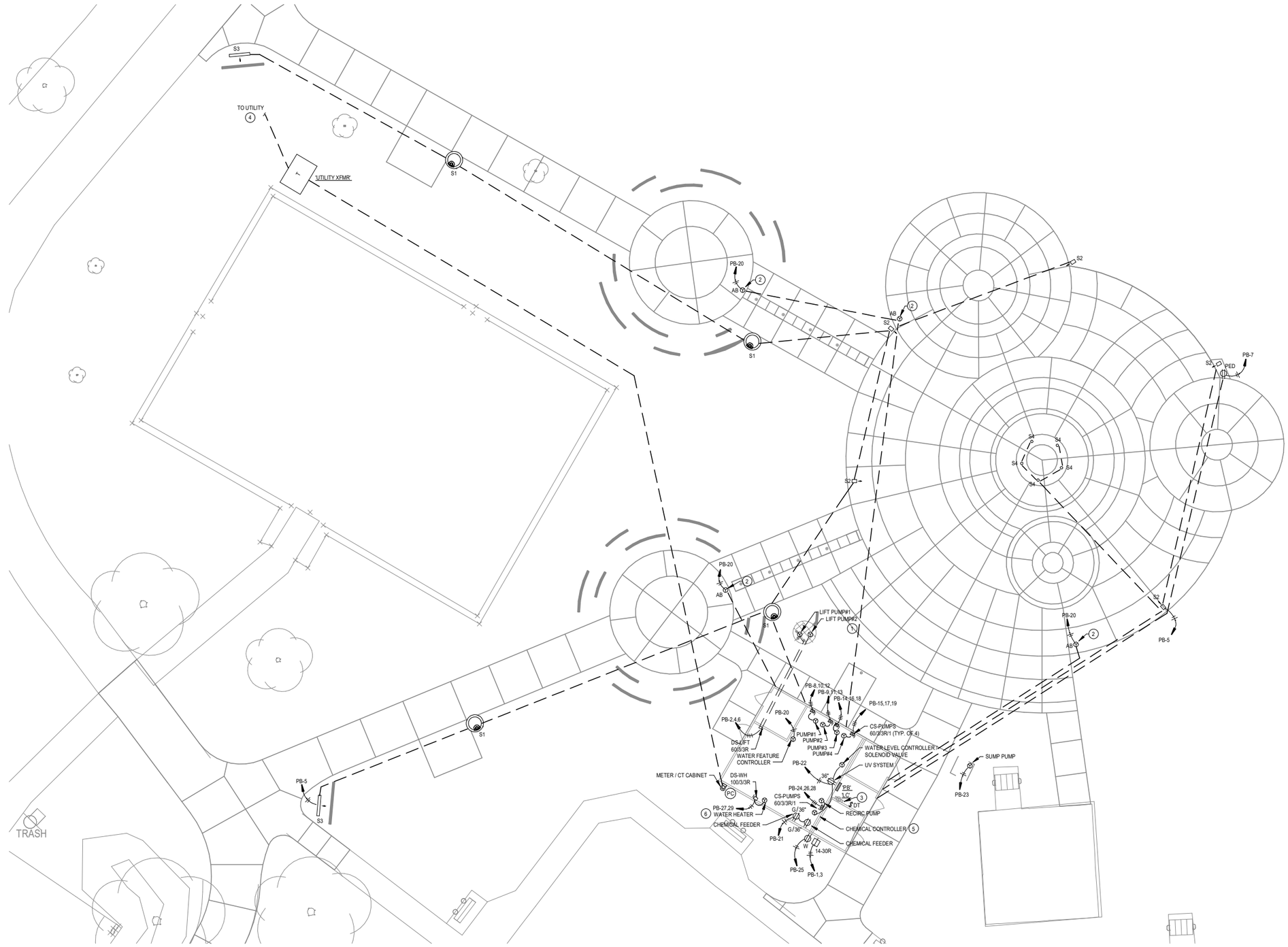
CITY OF MARSHALLTOWN, IOWA

MEGA-10 PARK WATER PLAZA

ELECTRICAL COVER SHEET

SHEET P.00



GENERAL NOTES:

1. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR WIRING ALL PUMPS, FLOW AND LEVEL SENSORS, CONTROLLERS, ETC., PER MANUFACTURER'S MANUALS TO COMPLETE THE WORKING WATER FEATURE SYSTEM. COORDINATE LOW VOLTAGE WIRING CONNECTIONS WITH SPLASH PAD EQUIPMENT SUPPLIER FOR CONNECTIONS TO FLOAT SWITCH, LEVEL SENSORS, AND SOLENOID VALVES. REFER TO SHEETS D.07 AND D.08 SPLASH PAD EQUIPMENT DRAWINGS FOR ADDITIONAL INFORMATION.
2. EXTERIOR LIGHT FIXTURES TO BE CONTROLLED BY AN EXTERIOR PHOTOCELL SENSOR MOUNTED ON THE MANUFACTURED RESTROOM BUILDING, S4 LIGHT FIXTURES ADDITIONALLY TO BE CONTROLLED BY TIMER. REFER TO THE LIGHTING CONTROL NARRATIVE ON SHEET P.04 FOR MORE INFORMATION.
3. COORDINATE WITH UTILITY COMPANY FOR REMOVAL OF EXISTING ELECTRICAL SERVICE TO DEMO'D RESTROOM BUILDING. UNDERGROUND CONDUIT/CONDUCTORS MAY BE ABANODONED IN PLACE.

KEYNOTES:

1. LIFT STATION PUMPS TO BE FED THROUGH PUMP CONTROLLER LOCATED IN PRE-MANUFACTURED BUILDING. PUMPS AND CONTROLLER PROVIDED AND INSTALLED BY OTHERS, WIRED BY E.C. (INCLUDING LOW VOLTAGE CONTROL WIRING TO FLOAT SENSORS FOR CONTROLS).
2. PROVIDE 1" CONDUIT FROM THE SPLASH PAD CONTROLLER TO THE ACTUATOR BUTTON 'AB'. EACH CONTROLLER TO PROVIDE DEDICATED WIRING FOR INDIVIDUAL CONTROL BY LOCATION. BUTTON AND PEDESTAL PROVIDED AND INSTALLED BY OTHERS, WIRED BY E.C.
3. LOAD CENTER PROVIDED WITH PRE-MANUFACTUREERED BUILDING. E.C. TO PROVIDE FEEDER TO PANEL. REFER TO RISER DIAGRAM 2/P.03 FOR ADDITIONAL INFORMATION.
4. COORDINATE TRANSFORMER PAD WITH G.C. PROVIDE (2) 4" CONDUIT SWEEPS FOR PRIMARY CONNECTION BY UTILITY PER ALLIANT ENERGY STANDARDS. UTILITY TO PROVIDE PRIMARY CONDUIT AND CONDUCTORS FROM TRANSFORMER TO UTILITY DISTRIBUTION ON SOUTH END OF AQUATIC CENTER (NORTH OF PROJECT).
5. COORDINATE WITH POOL EQUIPMENT SUPPLIER FOR 24V CONNECTIONS FROM CONTROLLER TO SENSORS AND CHEMICAL FEEDERS CONTROL.
6. COORDINATE FINAL EQUIPMENT CONNECTION FOR WATER HEATER WITH PLUMBING CONTRACTOR PRIOR TO INSTALLATION. SIZES SHOWN ARE BASED OFF PRELIMINARY EQUIPMENT SELECTIONS.

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Project #: 124-012
bluestone engineering

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SCALE FEET

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DRAWN	YS
CHECKED	RKL
BMI PROJ. NO.	076.128279

REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA

MEGA-10 PARK WATER PLAZA

ELECTRICAL PLAN

SHEET P.01

NOTES:

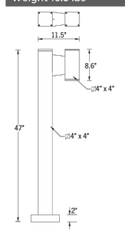
SHEET INCLUDED IN THE CONSTRUCTION DOCUMENTS FOR REFERENCE ONLY. FINAL LAYOUT AND SPECIFICATION OF FIXTURES TO BE PER MEP DRAWINGS.

UJE-10555

Jet 47 Square Single Head Bollard

LIGMAN LIGHTING USA

15w COB 1618 Lumens
IP65 • Suitable For Wet Locations
IK08 • Impact Resistant (Vandal Resistant)
Weight 16.5 lbs



Two-Piece Base Cover

Mounting Detail

Construction

Aluminum
Less than 0.1% copper content – Marine Grade 6060 extruded & LM6 Aluminum High Pressure die casting provides excellent mechanical strength , clean detailed product lines and excellent heat dissipation.

Pre paint
8 step degrease and phosphate process that includes deoxidizing and etching as well as a zinc and nickel phosphate process before product painting.

Memory Retentive -Silicon Gasket
Provided with special injection molded "fit for purpose" long life high temperature memory retentive silicon gaskets. Maintains the gaskets exact profile and seal over years of use and compression.

Thermal management
LM6 Aluminum is used for its excellent mechanical strength and thermal dissipation properties in low and high ambient temperatures. The superior thermal heat sink design by Ligman used in conjunction with the driver, controls thermals below critical temperature range to ensure maximum luminous flux output, as well as providing long LED service life and ensuring less than 10% lumen depreciation at 50,000 hours.

Surge Suppression
Standard 10kv surge suppressor provided with all fixtures.

BUG Rating
B1 - U0 - G0 [YW/W30/W40]
B2 - U0 - G0 [M/W30/W40, N/W30/W40, W/W30/W40]

Finishing.
All Ligman products go through an extensive finishing process that includes fettling to improve paint adherence.

Paint
UV Stabilized 4.9Mil thick powder coat paint and baked at 200 Deg C. This process ensures that Ligman products can withstand harsh environments. Rated for use in natatoriums.

Inspired by Nature Finishes
The Inspired by nature Finishing is a unique system of decorative powder coating. Our metal decoration process can easily transform the appearance of metal or aluminum product into a wood grain finish.

This patented technology enables the simulation of wood grain, and even marble or granite finish through the use of decorative powder coating.

The wood grain finish is so realistic that it's almost undistinguishable from real wood, even from a close visual inspection. The system of coating permeates the entire thickness of the coat and as a result, the coating cannot be removed by normal rubbing, chipping, or scratching.

The Coating Process
After pre-treatment the prepared parts are powder coated with a specially formulated polyurethane powder. This powder provides protection against wear, abrasion, impact and corrosion and acts as the relief base color for the finalized metal decoration.

The component is then wrapped with a sheet of non-porous film with the selected decoration pattern printed on it using special high temperature inks.

This printed film transfer is vacuum-sealed to the surface for a complete thermo print and then transferred into a customized oven. The oven transforms the ink into different forms within the paint layer before it becomes solid. Finally, the film is removed, and a vivid timber look on aluminum remains.

Wood grain coating can create beautiful wood-looking products of any sort. There are over 300 combinations of designs currently in use. Wood grains can be made with different colors, designs, etc.

Our powder coatings are certified for indoor and outdoor applications and are backed by a comprehensive warranty. These coatings rise to the highest conceivable standard of performance excellence and design innovation.

Added Benefits
- Resistance to salt-acid room, accelerated aging
- Boiling water, lime and condensed water resistant
- Anti-Graffiti, Anti-Slip, Anti-Microbial, Anti-Scratch
- Super durable (UV resistant)
- TGIC free (non-toxic)

Hardware
Provided Hardware is Marine grade 316 Stainless steel.

Anti Seize Screw Holes
Tapped holes are infused with a special anti seize compound designed to prevent seizure of threaded connections, due to electrolysis from heat, corrosive atmospheres and moisture.

Crystal Clear Low Iron Glass Lens
Provided with tempered, impact resistant crystal clear low iron glass ensuring no green glass tinge.

Optics & LED
Precise optic design provides exceptional light control and precise distribution of light.
LED CRI > 80

Lumen - Maintenance Life
L80 /B10 at 50,000 hours (This means that at least 90% of the LED still achieve 80% of their original flux)

Rectangular form bollard family. High performance, high output and numerous options ensure Jet can be configured for any application.

The Jet's square shape integrated with square column provides downlight distribution with optimal visual comfort through great glare control fulfilling dark sky criteria. Long service life and vandal resistance are the further characteristics of this compact bollard. Developed for lighting driveways, pathways and squares.

Color temperature 2700K, 3000K, 3500K and 4000K, LED CRI >80 and life time 50,000 Hours.

Custom bollard heights are available, please specify.Custom wattages can be provided to suit customer and Title 24 requirements. (Specify total watts per fixture)

To meet International Dark Sky criteria, 3000k or warmer LEDs must be selected.

Additional Options (Consult Factory For Pricing)

FHM
Flush Head Mount

PRODUCT NOTES
BOLLARD HEAD: JET 32
COLOR: BLACK RAL 9011

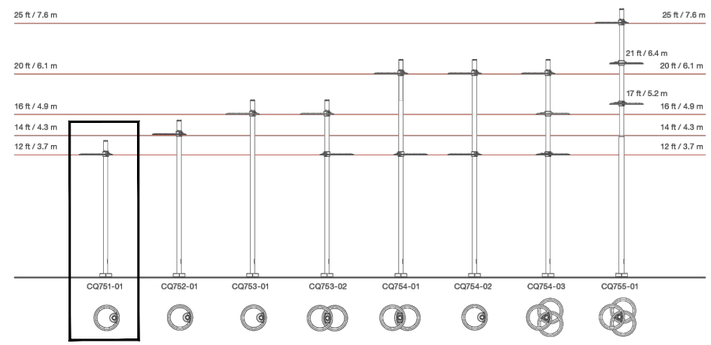
Ligman Lighting USA reserves the right to change specifications without prior notice,please contact factory for latest information. Due to the continual improvements in LED technology data and components may change without notice.

1 BOLLARD, JET BOLLARD (LIGMAN LIGHTING)
SCALE: N.T.S.

Typology Ring Light

landscape forms

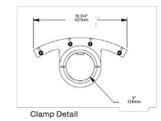
Spec Sheet | CQ700



Pole

Round pole is 5" diameter or stepped 6" to 5" diameter depending on height. Manufactured from seamless 6063 aluminum alloy and heat treated to produce a T6 temper. Pole is topped with aluminum driver housing assembly. Flush mounted hand hole cover includes two magni-coated fasteners.

Base plate is cast aluminum A356 alloy heat treated to a T6 temper. Base options include four cast aluminum nut covers or a two-piece cast aluminum cover plate. Pole is mounted at grade with galvanized steel anchor bolts. Template and anchor hardware included.



Mounting

Housing is attached to a 5" diameter section of pole with a two-piece permanent mold cast compression clamp. All hardware is magni-coated steel.

Pole

Height	No. of Luminaires	Pole Part Number	Description	Wall Thickness	Pole Weight
12ft (3.7m)	1	CQ751-01	5" (127mm) Straight Round Aluminum Pole; Single Luminaire at 12ft (3.7m)	0.125" (3.175mm)	35 lbs
14ft (4.3m)	1	CQ752-01	5" (127mm) Straight Round Aluminum Pole; Single Luminaire at 14ft (4.3m)	0.125" (3.175mm)	40 lbs
16ft (4.9m)	1	CQ753-01	5" (127mm) Straight Round Aluminum Pole; Single Luminaire at 16ft (4.9m)	0.125" (3.175mm)	45 lbs
16ft (4.9m)	2	CQ753-02	5" (127mm) Straight Round Aluminum Pole; (2) Luminaire at 16ft (4.9m) and 12ft (3.7m)	0.125" (3.175mm)	45 lbs
20ft (6.1m)	2	CQ754-01	5" (127mm) Straight Round Aluminum Pole; (2) Luminaires at 20ft (6.1m) and 12ft (3.7m) 180 Degree Orientation	0.156" (3.962mm)	76 lbs
20ft (6.1m)	2	CQ754-02	5" (127mm) Straight Round Aluminum Pole; (2) Luminaires at 20ft (6.1m) and 12ft (3.7m) with Same Orientation	0.156" (3.962mm)	76 lbs
20ft (6.1m)	3	CQ754-03	5" (127mm) Straight Round Aluminum Pole; (3) Luminaires at 20ft (6.1m), 16ft (4.9m), and 12ft (3.7m) in CCW Spiral Configuration with 120 Degree Orientation Offset	0.188" (4.775mm)	87 lbs
25ft (7.6m)	3	CQ755-01	6" (152.4mm) to 5" (127mm) Stepped Round Aluminum Pole; (3) Luminaires at 25ft (7.6m), 21ft (6.4m), and 17ft (5.2m) in CCW Spiral Configuration with 120 Degree Orientation Offset	0.188" (4.775mm)	105 lbs

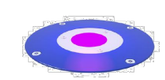
2 PEDESTRIAN LIGHT, TYPOLOGY RING LIGHT (LANDSCAPE FORMS)
SCALE: N.T.S.

VOR 7056

LED LIGHT

PRODUCT HIGHLIGHTS

- Introduces another dimension to any Splashpads® by extending operational hours
- Create an inviting and exciting attraction to parks with visually stunning lighting effects
- Sustainable for outdoor and wet conditions
- Red, Green, Blue and pure White LED colors
- Made of 316 stainless steal



H/W/L	LIGHT SPECIFICATIONS	PRODUCT COLOR	ELECTRICAL REQUIREMENTS
0/9/9 in 0/20/20 cm	4-1 RGBW LED Beam angle: 20°	BLUE - RAL 5017 Anti-slippery paint surface	Wattage: 10W Voltage: 12VAC

** Requires combined DMX/POWER cable (refer to specifications & Install Drawing)*

VORTEX
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1.877.586.7839 (free USA/CANADA)
+1.514.694.3868 (INTERNATIONAL)

3 IN-GRADE WATER PROOF UPLIGHT
SCALE: N.T.S.

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DRAWN BH/AC
CHECKED NW
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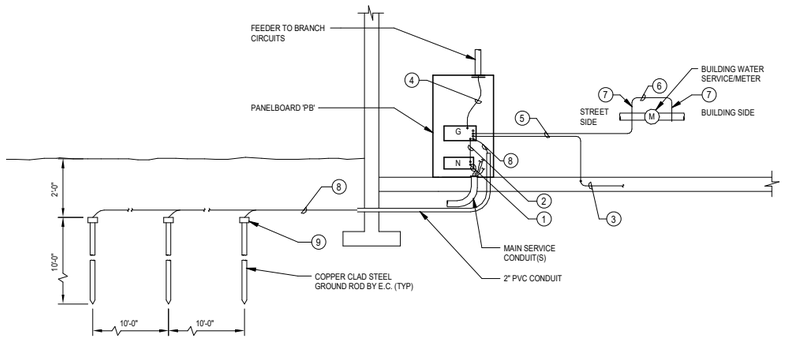
REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
WATER PLAZA AT MEGA-10 PARK
ELECTRICAL DETAILS

SHEET P.02

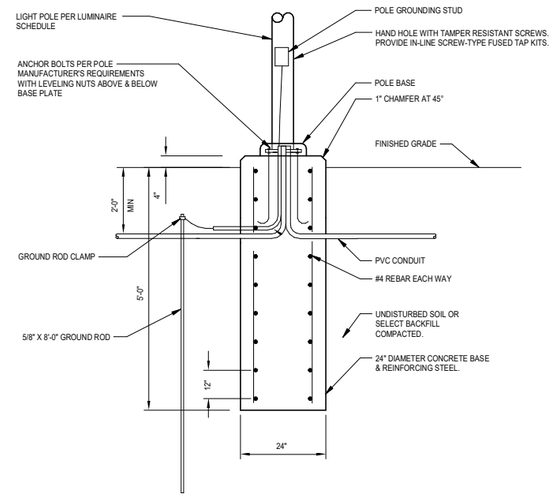


6 SERVICE GROUNDING DETAIL

N.T.S.

GROUNDING KEYED NOTES:
(SEE PLANS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. SERVICE NEUTRAL CONDUCTOR; SAME SIZE AS PHASE CONDUCTORS.
2. MAIN BONDING JUMPER; SIZE THE SAME AS THE MAIN GROUNDING ELECTRODE CONDUCTOR.
3. CONCRETE-ENCASED ELECTRODE. 4 AWG OR LARGER BARE COPPER CONDUCTOR, STEEL REINFORCING BAR OR ROD NOT LESS THAN 1/2" DIAMETER AT LEAST 20' LONG. INSTALLED PER NEC 250.52.
4. EQUIPMENT GROUND CONDUCTOR; SIZE PER NEC TABLE 250.122 OR AS SHOWN ON THE PLANS.
5. COPPER BONDING CONDUCTOR: #2 MINIMUM
6. #2 COPPER JUMPER OVER WATER METER.
7. GROUND STRAP FOR WATER PIPING.
8. MAIN COPPER GROUNDING ELECTRODE CONDUCTOR: #2 MINIMUM
9. FURNISH AND INSTALL COUNTERPOISE SYSTEM GROUND ROD USING AN EXOTHERMIC CONNECTION. VERIFY THAT SERVICE GROUND IMPEDANCE IS LESS THAN 5 OHMS.

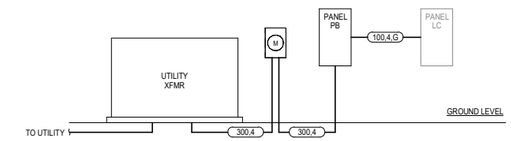


4 POLE BASE STANDARD

N.T.S.

NOTES:

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.

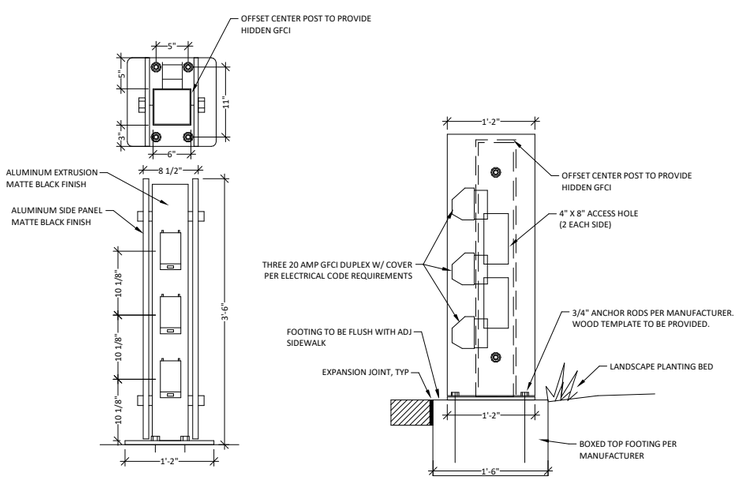


2 ELECTRICAL RISER DIAGRAM

N.T.S.

PANEL FEEDER SCHEDULE - COPPER						
CALL OUT	OCPD RATING	PARALLEL SETS	PHASE	NEUTRAL	GRD	CONDUIT
100,4,G	100	1	#3	#3	#8	1-1/4"
300,4	300	1	300KCM	300KCM		3"

PANEL FEEDER SCHEDULE - ALUMINUM						
CALL OUT	OCPD RATING	PARALLEL SETS	PHASE	NEUTRAL	GRD	CONDUIT
100,4,G	100	1	#1	#1	#6	1-1/2"
300,4	300	1	500KCM	500KCM		3-1/2"



5 POWER PEDESTAL

N.T.S.

PANEL "__#__"

FED FROM "_#_"

(VOLTAGE)

(AIC RATING)

PHASE A - BLACK
PHASE B - RED
PHASE C - BLUE
NEUTRAL - WHITE
GROUND - GREEN

ENGINEER: BLUESTONE ENGINEERING

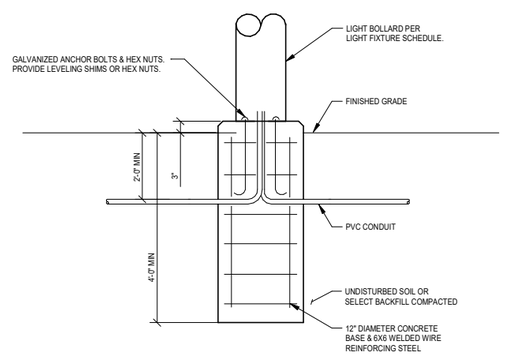
CONTRACTOR:

3 PANEL BOARD NAMEPLATE

N.T.S.

NOTES:

1. NAME PLATE SHALL BE PERMANENTLY ATTACHED TO PANELBOARD. REFER TO SPECIFICATION SECTION 260553 FOR NAMEPLATE CONSTRUCTION REQUIREMENTS.



1 BOLLARD BASE

N.T.S.

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REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA

MEGA-10 PARK WATER PLAZA

ELECTRICAL DETAILS

SHEET P.03

PANELBOARD: PB

LOCATION:
MOUNTING/TYPE: SURFACE / TYPE 1
FED FROM: UTILITY XFMR
NOTES:

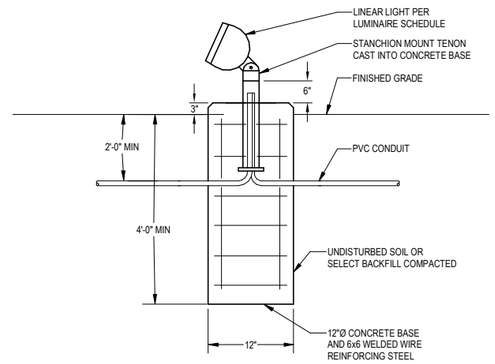
VOLTAGE: 208/120 Wye
PHASE: 3
WIRE: 4

MAIN DEVICE: 300 A - MCB
BUS RATING: 400
NEUTRAL RATING: 100%
A.I.C. RATING: 22000

LOAD DESCRIPTION	BKR	PL	CKT	A (KVA)		B (KVA)		C (KVA)		CKT	PL	BKR	LOAD DESCRIPTION
(G)14-30R RECEPT	30 A	2	1	2.0	1.9					2	3	35 A	(G)LIFT STATION
			3			2.0	1.9			4			
(G)LIGHTING	20 A	1	5					0.4	1.9	6			
RECEPT PEDESTAL	20 A	1	7	0.5	1.9					8	3	40 A	(G)PUMP #1
(G)PUMP #2	40 A	3	9			1.9	1.9			10			
			11					1.9	1.9	12			
			13	1.9	1.9					14	3	40 A	(G)PUMP #3
(G)PUMP #4	40 A	3	15			1.9	1.9			16			
			17					1.9	1.9	18			
			19	1.9	0.1					20	1	20 A	(G)FEATURE CTRL
CHEMICAL FEEDER	20 A	1	21			0.4	0.2			22	1	20 A	(G)UV SYSTEM
(G)SUMP PUMP	20 A	1	23					0.5	1.9	24	3	40 A	(G)RECIRC PUMP
RECEPT	20 A	1	25	0.2	1.9					26			
(G) WATER HEATER	80 A	2	27			6.1	1.9			28			
			29					6.1	0.0	30	1	20 A	SPARE
SPARE	20 A	1	31	0.0	0.0					32	1	20 A	SPARE
SPACE	--	1	33			--	0.0			34	1	20 A	SPARE
SPACE	--	1	35					--	0.0	36	1	20 A	SPARE
SPACE	--	1	37	--	--					38	1	--	SPACE
LC LOAD CENTER	100 A	2	39			6.0	--			40	1	--	SPACE
			41					6.0	--	42	1	--	SPACE
	TOTAL LOAD:			14420 VA		26240 VA		24574 VA					
	TOTAL AMPS:			120 A		232 A		218 A					

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals:	
LIGHTING	374 VA	100%	374 VA		
POWER	0 VA	0%	0 VA	**CONNECTED LOAD:**	65234 VA
Other	0 VA	0%	0 VA	**ESTIMATED DEMAND:**	69709 VA
RECEPT	5260 VA	100%	5260 VA	**CONNECTED CURRENT:**	181 A
CONTINUOUS	12100 VA	125%	15125 VA	**EST. DEMAND CURRENT:**	193 A
MTR	35300 VA	104%	36750 VA		
HEAT	12200 VA	100%	12200 VA		

NOTES:
(G) DENOTES GFCI BREAKER



1 SIGNAGE LIGHTING BASE
N.T.S.

GENERAL ELECTRICAL SCHEDULE

SYMBOL	DESCRIPTION	MANUFACTURER
J	ELECTRICAL CONNECTION TO MISC. EQUIPMENT	EQUIPMENT FURNISHED AND INSTALLED BYOTHERS
PANEL 'PB'	BRANCH CIRCUIT PANELBOARD, 208/120V, 3-PHASE, 4-WIRE, NEMA 1 HOUSING, REFER TO PANEL SCHEDULES FOR DETAILS	SQUARE D NQ SIEMENS CUTLER-HAMMER GENERAL ELECTRIC
METER	METER SOCKET, COORDINATE WITH UTILITY	MILBANK AMERICAN MIDWEST POWER
DS-XXX A/B/C	DISCONNECT SWITCH, HEAVY DUTY, SIZE INDICATED ON PLANS (A/B/C) WHERE A = RATING IN AMPS, B = NUMBER OF POLES, C = NEMA RATING (E.G. 1 = NEMA 1), XXX = NAME OF LOAD SERVED	SQUARE D CLASS 3110 SIEMENS CUTLER-HAMMER GENERAL ELECTRIC
CT CABINET	CURRENT TRANSFORMER CABINET, COORDINATE WITH UTILITY	AMERICAN MIDWEST POWER OR EQUAL
CS-XXX A/B/C/D	COMBINATION STARTER CONTAINING FUSED DISCONNECT SWITCH AND NON-REVERSING NEMA STARTER (MINIMUM SIZE 0), VOLTAGE PER PLANS, XXX = NAME OF LOAD SERVED, HAND-OFF-AUTO AND RED "RUN" PILOT LIGHT IN DOOR, A = FDS RATING IN AMPS, B = FDS NUMBER OF POLES, C = NEMA RATING, D = STARTER SIZE	SQUARE D CLASS 8502 SIEMENS CUTLER-HAMMER GENERAL ELECTRIC

MINIMUM BRANCH CIRCUIT FEEDER SIZE (RHW, THHW, THW, THWN, XHHW, XHWN, USE, ZE) BASED ON NEC 2020 AT 75°C

BREAKER SIZE	PHASE/ NEUTRAL	GRD	CONDUIT
20A	12	12	3/4"
25A	10	10	3/4"
30A	10	10	3/4"
35A	8	10	1"
40A	8	10	1"
50A	6	10	1"
60A	4	10	1-1/4"
70A	4	8	1-1/4"
80A	3	8	1-1/2"
100A	1	8	2"

LIGHTING CONTROL NARRATIVE

ALL EXTERIOR LIGHT FIXTURES SHALL BE CONTROLLED VIA TIMER CONTROL BOX.

1. 'S1' POLE LIGHT FIXTURES WILL BE CONTROLLED BY A PHOTOCELL SENSOR, AUTOMATICALLY TURNING ON AT DUSK AND OFF AT DAWN.
2. 'S2' BOLLARD LIGHT FIXTURES WILL BE CONTROLLED BY A PHOTOCELL SENSOR, AUTOMATICALLY TURNING ON AT DUSK AND OFF AT DAWN.
3. 'S3' SIGNAGE LIGHTING FIXTURES WILL BE CONTROLLED BY A PHOTOCELL SENSOR, AUTOMATICALLY TURNING ON AT DUSK AND OFF AT DAWN.
4. 'S4' IN-GRADE LIGHT FIXTURES WILL BE CONTROLLED BY BOTH A PHOTOCELL SENSOR AND A TIMER, AUTOMATICALLY TURNING ON AT DUSK AND OFF AFTER MIDNIGHT.

SWITCH SUBSCRIPT SCHEDULE

SUBSCRIPT	DESCRIPTION	MODEL NO.
DT	ASTRONOMICAL TIMER WITH PHOTOCELL INPUT, MINIMUM 2 ZONES OF CONTROL, 20A INTEGRAL RELAYS	TORK DLC400BP APPROVED EQUAL

PHOTOCELL SCHEDULE

SUBSCRIPT	DESCRIPTION	MODEL NO.
PC	ANALOG PHOTOCELL SENSOR, SUPPLIED WITH THE TIMER SWITCH	TORK EPC2 APPROVED EQUAL

SPECIALTY RECEPTACLE SUBSCRIPT SCHEDULE

SUBSCRIPT	DESCRIPTION	MODEL NO.
14-30R	NEMA 14-30R RECEPTACLE, SURFACE MOUNTED, PROVIDE WITH WEATHER RESISTANT WHILE IN USE COVER	HUBBELL HBL9430A LEVITON PASS & SEYMOUR COOPER

NEMA 5-20R RECEPTACLE SUBSCRIPT SCHEDULE

SUBSCRIPT	DESCRIPTION	MODEL NO.
G	DUPLEX GROUND FAULT RECEPTACLE, NEMA 5-20R	HUBBELL GFR5352ST LEVITON PASS & SEYMOUR COOPER
W	DUPLEX GROUND FAULT RECEPTACLE, NEMA 5-20R, DIE-CAST WEATHERPROOF COVER (WHILE IN USE)	HUBBELL GFR5352ST/WP26E LEVITON PASS & SEYMOUR COOPER
NO SUBSCRIPT	DUPLEX RECEPTACLE, NEMA 5-20R, HEAVY DUTY SPECIFICATION GRADE	HUBBELL HBL5362 LEVITON PASS & SEYMOUR COOPER
PED	THREE DUPLEX GROUND FAULT RECEPTACLES, MOUNTED IN 42" DECORATIVE PEDESTAL, NEMA 5-20R, ALUMINUM BOLLARD WITH WOOD ACCENT PANEL, REFER TO DETAIL S/P. 03, PROVIDE WITH CONCRETE BASE PER MANUFACTURER RECOMENDATIONS	STUCTURA TBL

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	MODEL	WATTS	LIGHT SOURCE	POWER SUPPLY	MOUNTING	VOLT	ACCEPTABLE MANUFACTURERS
S1	POLE MOUNTED LIGHT FIXTURE, ONE RING SHAPED HEAD, 12' HEIGHT. TYPE V DISTRIBUTION, MINIMUM 2175 DELIVERED LUMENS, MATTE BLACK FINISH, 5" DIAMETER ALUMINUM POLE SUPPLIED WITH LIGHT FIXTURE, REFER TO DETAIL 4/P.03 SHEET FOR CONCRETE BASE	LANDSCAPE FORMS	CQ751-01	40 W	4000K LED	DRIVER	POLE	120 V	PRE APPROVED EQUAL
S2	DECORATIVE PEDESTRIAN BOLLARD, 47" HEIGHT, MINIMUM 1600 DELIVERED LUMENS, 71° DISTRIBUTION, BLACK FINISH. REFER TO DETAIL 1/P.03 SHEET FOR CONCRETE BASE	LIGMAN	UJE-10555	15 W	4000K LED	DRIVER	BOLLARD	120 V	PRE APPROVED EQUAL
S3	EXTERIOR LINEAR LED LIGHT, 4' LENGTH, 500 LUMENS PER FOOT, 60X120 OPTICS, AIMABLE KNUCKLE MOUNT, BLACK FINISH, 2' SETBACK FROM THE SIGNAGE. PROVIDE TWO MOUNTING BASES, REFER TO THE SHEET P.04 FOR CONCRETE BASE DETAILS.	HYDREL	4750L	22 W	4000K LED	DRIVER	GROUND	120 V	PRE APPROVED EQUAL
S4	6" DIAMETER IN-GRADE LIGHT FIXTURE FACTORY SEALED, SUBMERGABLE HOUSING, IP69K RATED, STAINLESS STEEL TRIM, 1400 DELIVERED LUMENS, 40° DISTRIBUTION	TARGETTI	KEPLERO MINI	14 W	4000K LED	DRIVER	IN GRADE	120 V	PRE APPROVED EQUAL

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CHECKED	RKL
BMI PROJ. NO.	0T6.128279

REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA
MEGA-10 PARK WATER PLAZA
ELECTRICAL DETAILS AND SCHEDULES

SHEET
P.04

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.

MATERIAL NOTES:

REINFORCED CONCRETE:

CONCRETE:	4000 PSI @ 28 DAYS AIR CONTENT: 6.5% ± 1.5% W/C+P: 0.42
REINFORCEMENT BARS:	
DEFORMED BARS	ASTM A615, GRADE 60

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=4000 PSI	SLAB, WALL, COLUMN		90 DEGREE HOOK
BAR SIZE	BAR LAP	TOP BAR	
#3	19 IN.	24 IN.	6 IN.
#4	25 IN.	32 IN.	8 IN.
#5	31 IN.	40 IN.	10 IN.
#6	37 IN.	48 IN.	12 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
   #5 BARS OR SMALLER 1-1/2"
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, AND OPENINGS NOT SHOWN ON THE STRUCTURAL DRAWINGS, SEE MECHANICAL, PLUMBING, HVAC AND ELECTRICAL DRAWINGS. CONTRACTOR SHALL VERIFY AND COORDINATE REQUIREMENTS FOR AND LOCATION OF ABOVE ITEMS WHETHER SHOWN ON THE STRUCTURAL DRAWINGS OR NOT.
6. BEVEL ALL EXPOSED CORNERS OF CONCRETE 3/4" x 3/4".

DESIGN CRITERIA & LOADING

1. CODE: 2015 INTERNATIONAL BUILDING CODE (IBC).
2. DESIGN LOADING - ART INSTALLATION
   LOADING PROVIDED VIA STAMPED DRAWING BY ART INSTALLLATION MANUFACTURER.

DEAD LOAD:	3 KIP
SNOW LOAD:	3.2 KIP
WIND LOAD (SHEAR @ BASE)	0.6 KIP
MOMENT (FROM WIND @ BASE)	3.0 KIP*FT

3. DESIGN LOADING - HUFFCUTT BUILDING

DEAD LOADS (D)		
MATERIALS		CALCULATED
LIVE LOADS (L)		
FLOOR		
ROOF LIVE LOADS (L/r)		
UNIFORM		20 PSF
SNOW LOADS (S)		
P_g	GROUND SNOW LOAD	25 PSF
P_f	FLAT-ROOF SNOW LOAD	17.0
C_e	SNOW EXPOSURE FACTOR	0.9
I_s	SNOW LOAD IMPORTANCE FACTOR	1.0
C_t	THERMAL FACTOR	1.2
C_s	SLOPE FACTOR	0.9
WIND LOAD (W)		
V	BASIC WIND SPEED	110 MPH (3 SECOND GUST)
V_{asd}	ASD WIND SPEED (V*√(0.6))	85 MPH
RISK (OCCUPANCY) CATEGORY		II
EXPOSURE CATEGORY		B
GC_{pi}	INTERNAL PRESSURE COEFFICIENT	+/- 0.18

FOUNDATION AND SOIL NOTES:

1. THE GEOTECHNICAL ENGINEER SHALL REVIEW AND APPROVE FOUNDATION BEARING SURFACES PRIOR TO THE PLACEMENT OF FOOTINGS OR FOUNDATION.
2. PROTECT FOUNDATION SOILS FROM FREEZING DURING CONSTRUCTION.
3. PLACE FILL AND BACKFILL AND COMPACT TO FOLLOWING MAXIMUM STANDARD PROCTOR DENSITIES UNLESS NOTED OTHERWISE IN THE SPECIFICATIONS:

LOCATION	DENSITY
FILL BELOW FOOTINGS	100%
FILL BELOW SLABS ON GRADE	98%
PIPE AND STRUCTURE EXCAVATIONS	95%
GREEN SPACES	90%

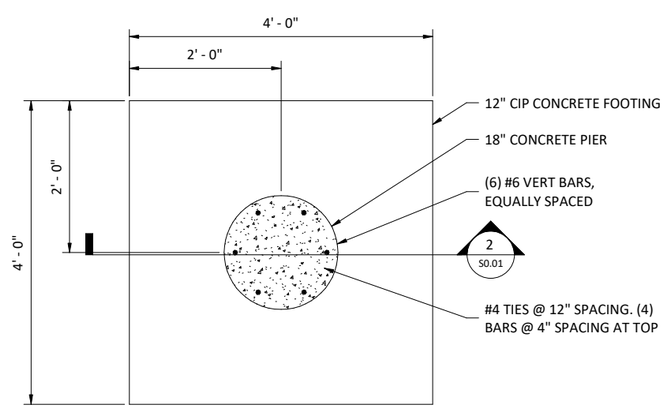
4. FOUNDATION DESIGN IS BASED ON REQUIREMENTS OF GEOTECHNICAL EVALUATION
   REPORT NO. 242048MWP
   DATED: 07/03/2024
   PREPARED BY: CONSTRUCTION MATERIALS TESTING
5. SOIL BEARING PRESSURES:
   ALLOWABLE SOIL BEARING PRESSURE:
   2,500 PSF @ ISOLATED COLUMN PADS
   2,000 PSF @ CONTINUOUS FOOTINGS
   BEARING CAPACITY FAILURE FACTOR OF SAFETY: 3.0

ANCHOR BOLTS:

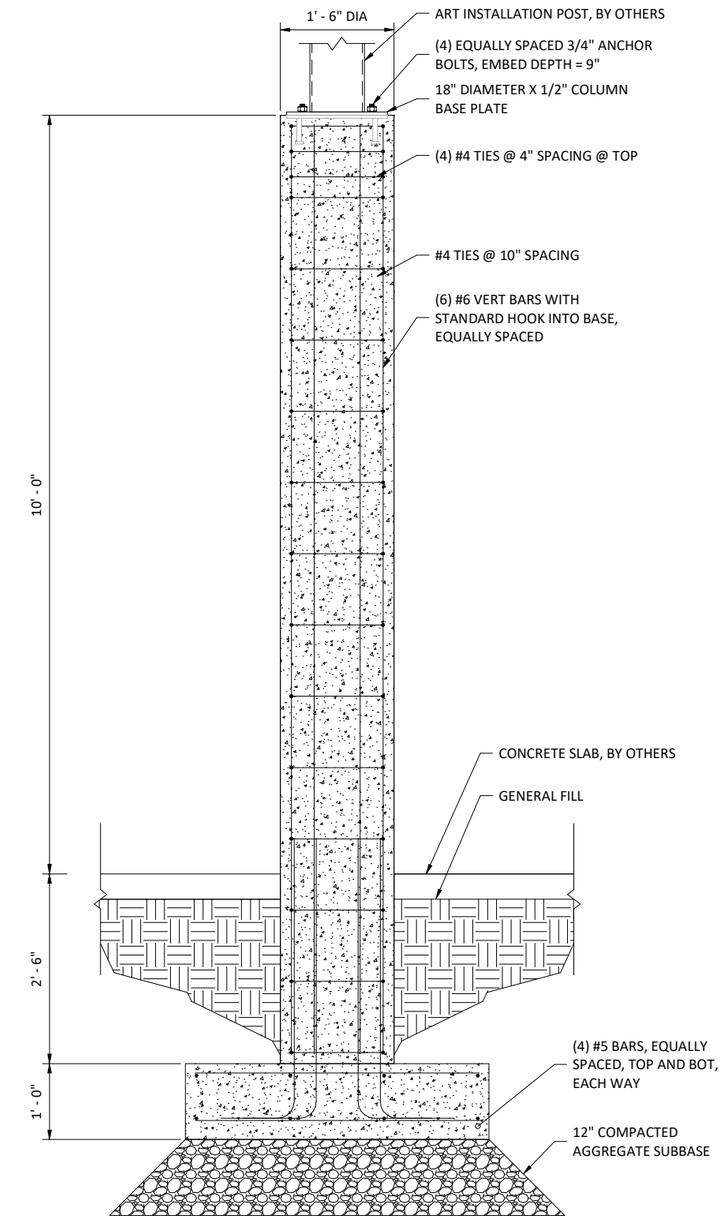
1. ALL ANCHOR RODS SHALL BE SUPPLIED AND INSTALLED BY THE CONCRETE CONTRACTOR, UNLESS NOTED OTHERWISE.
2. ALL ANCHOR RODS SHALL BE ASTM F1554 GRADE 36 HEX-HEAD, UNLESS NOTED OTHERWISE. NUTS SHALL BE ASTM A563 GRADE A HEAVY HEX. OVER-SIZED PLATE WASHERS SHALL BE ASTM A36.
3. ALL ANCHOR RODS SHALL BE SET WITH TEMPLATES.
4. POST-INSTALLAED ANCHORS SHALL BE ADHESIVE ANCHORING SYSTEM PROVIDED AND INSTALLED BY FRAMING CONTRACTOR. ADHESIVE ANCHOR SHALL BE "HILTI HIT-HY 200 ADHESIVE ANCHOR SYSTEM" OR APPROVED ALTERNATE. ANCHORS SHALL BE "HILTI HAS-E" THREADED ROD CONFORMING TO ISO 898-1 CLASS 5.8 OR SHALL BE MADE FROM ALL-THREADED ROD CONFORMING TO ASTM A572 GRADE 60, OR APPROVED ALTERNATE, UNLESS NOTED OTHERWISE.
5. REFER TO THE ARCHITECTURAL PLANS AND SPECIFICATIONS FOR SPECIFIC DESIGN INFORMATION FOR ROOF PANELS, WALL PANELS, ROOF INSULATIONS, AND WALL INSULATION.

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.



1 S0.01 PLAN - ART INSTALLATION BASE AND FOUNDATION
1" = 1'-0"



2 S0.01 SECTION - ART INSTALLATION BASE AND FOUNDATION
1" = 1'-0"

SCALES SHOWN ARE BASED ON FULL SIZE (22X34) DRAWINGS. REDUCE SCALES BY 2 FOR 11X17 DRAWINGS.

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CITY OF MARSHALLTOWN, IOWA
ART INSTALLATION AND SHOWERHOUSE FOUNDATIONS
STRUCTURAL NOTES AND DETAILS

SHEET S0.01

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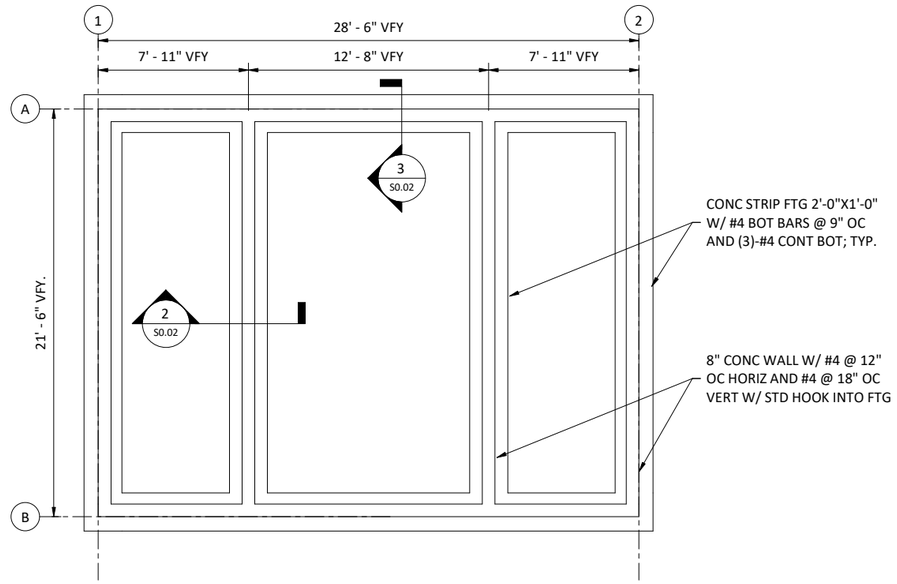
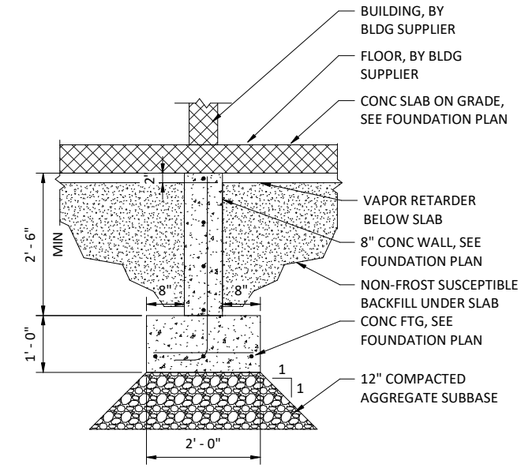
FOUNDATION PLAN NOTES:

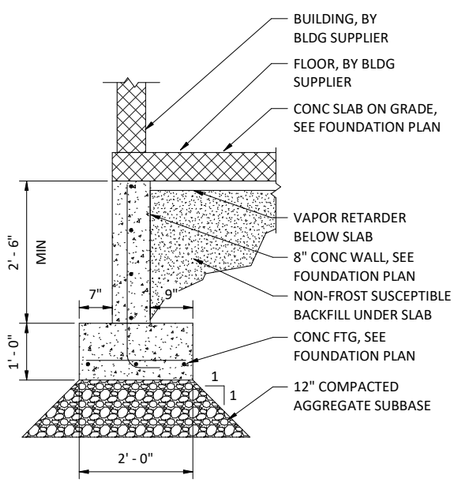
1. SCALES SHOWN ARE BASED ON FULL SIZE (22X34) DRAWINGS. REDUCE SCALES BY 2 FOR 11X17 DRAWINGS.
2. FOR GENERAL STRUCTURAL NOTES SEE SHEET S0.01
3. FOOTINGS ARE CENTERED ON WALLS, UNO
4. CONTRACTOR TO VERIFY FOUNDATION DIMENSIONS WITH HUFFCUTT SHOP DRAWINGS



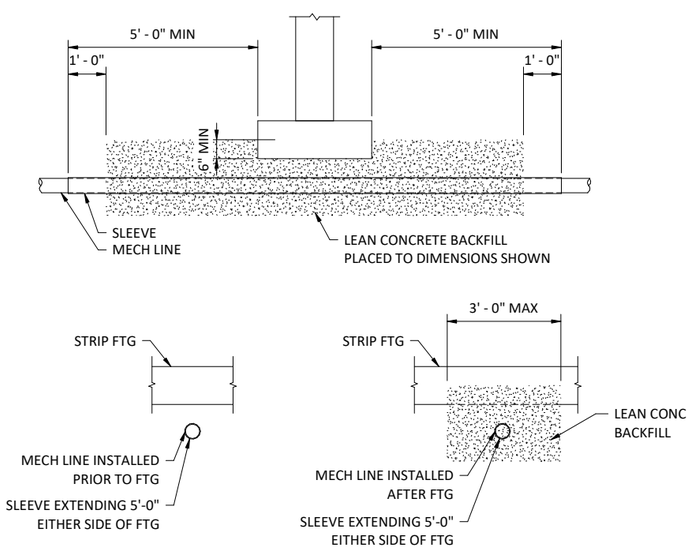
1 S0.02 PLAN - FOUNDATION
1/4" = 1'-0"



2 S0.02 DETAIL - TYPICAL INTERIOR FOUNDATION
3/4" = 1'-0"



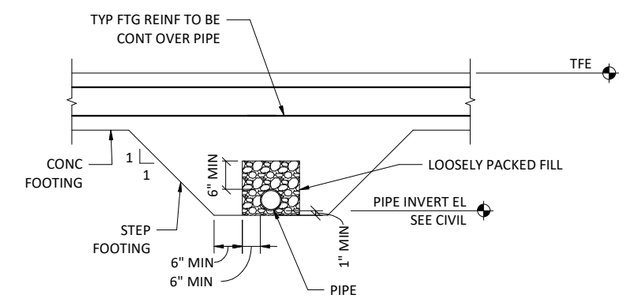
3 S0.02 DETAIL - TYPICAL EXTERIOR FOUNDATION
3/4" = 1'-0"



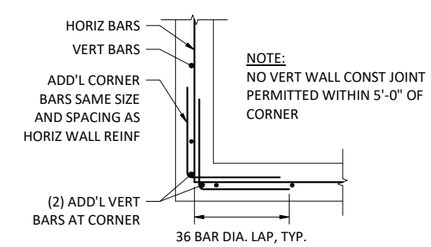
OPTION "A": INSTALLED PRIOR TO FOOTING

OPTION "B": INSTALLED AFTER FOOTING

4 S0.02 DETAIL - CONTRACTORS OPTIONS AT MECH LINES BENEATH FTG
1/2" = 1'-0"



5 S0.02 DETAIL - STEPPED FOOTING FOR PIPE BELOW
3/4" = 1'-0"



NOTE:
NO VERT WALL CONST JOINT PERMITTED WITHIN 5'-0" OF CORNER

6 S0.02 DETAIL - TYPICAL FOUNDATION WALL CORNER
3/4" = 1'-0"

SCALES SHOWN ARE BASED ON FULL SIZE (22X34) DRAWINGS. REDUCE SCALES BY 2 FOR 11X17 DRAWINGS.

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CITY OF MARSHALLTOWN, IOWA
ART INSTALLATION AND SHOWERHOUSE FOUNDATIONS
STRUCTURAL NOTES AND DETAILS

SHEET S0.02

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PROJECT MANUAL

Water Plaza at Mega-10 Park

City of Marshalltown

Marshalltown, Iowa

September 2024

BMI Project No. 0T6.128279

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SECTION 00005 - CERTIFICATION PAGE

PROJECT MANUAL

FOR

WATER PLAZA AT MEGA-10 PARK

CITY OF MARSHALLTOWN

MARSHALLTOWN, IOWA

SEPTEMBER 2024

BMI PROJECT NO. 0T6.128279

LICENSED PROFESSIONAL ENGINEER KATHRYN EVELYN STERK P24399 IOWA	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: 9/27/2024 KATHRYN E. STERK, P.E. License No. P24399 My renewal date is December 31, 2024 Pages or sheets covered by this seal: SUPPLEMENTAL SPECIFICATIONS: 33 32 16

LICENSED PROFESSIONAL ENGINEER GREGORY A. BROUSSARD 21974 IOWA	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: 9/27/2024 GREGORY A. BROUSSARD, P.E. License No. 21974 My renewal date is December 31, 2025 Pages or sheets covered by this seal: ALL GENERAL CONDITIONS AND FRONTEND

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PROFESSIONAL LANDSCAPE ARCHITECT
NATHAN M. WEITL
00677
IOWA

I hereby certify that the portion of this technical submission described below
was prepared by me or under my direct personal supervision and responsible charge. I am a duly licensed Professional Landscape Architect under the laws of the State of Iowa.

LIC NO. 00677 Date: 9/27/2024
My License renewal date is June 30, 2025
Pages or sheets covered by this seal:
TECHNICAL SPECIFICATIONS

LICENSED PROFESSIONAL ENGINEER
JEFF A. BARTLEY
16586
IOWA

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.

JEFF A. BARTLEY

LICENSE NUMBER: 16586 DATE: 09/27/2024

MY LICENSE RENEWAL DATE IS December 31, 2024

PAGES OR SHEETS COVERED BY THIS SEAL:
SUPPLEMENTAL SPECIFICATIONS: DIVISION 01, 10, 13, 31, 33 46 10, 33 49 10

LICENSED PROFESSIONAL ENGINEER
RICHARD K. LARSON
16014
IOWA

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 09/27/2024 Date

Richard K. Larson
License number 16014
My license renewal date is December 31, 2025.
Pages or sheets covered by this seal: DIVISION 26

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City of Marshalltown

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PROJECT MANUAL:

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00200 - INSTRUCTIONS TO BIDDERS
00410 - PROPOSAL
00420 - BID BOND
00500 - CONTRACT
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00800 - SPECIAL PROVISIONS
00900 - NOTICE OF AWARD
00910 - NOTICE TO PROCEED

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TS2 – NON-SKID RUBBERIZED COATING
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DIVISION 26

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Supplemental Specifications
City of Marshalltown

DRAWINGS (UNDER SEPARATE COVER):

46 sheets numbered A.01 through S.02, inclusive, dated September 2024, and with each sheet bearing the following general title:

Water Plaza at Mega-10 Park
City of Marshalltown

This project is based on
SUDAS STANDARD SPECIFICATIONS, 2024 EDITION
unless modified herein.

******END OF SECTION******

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SECTION 00100 - NOTICE TO BIDDERS

Water Plaza at Mega-10 Park
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 November 20, 2024, 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 November 25, 2024, 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 November 15, 2025. Liquidated damages are as set forth in 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 401 E Grand Ave, Suite 101, Des Moines, IA 50309. 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 #9319208 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: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that generally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid items include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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

_____

Alicia Hunter
Clerk

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SECTION 00110 - NOTICE OF PUBLIC HEARING

Water Plaza at Mega-10 Park
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 November 11, 2024, at 24 N. Center Street, Marshalltown, Iowa 50158.

PROJECT DESCRIPTION: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that generally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid items include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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.

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SECTION 00200 - INSTRUCTIONS TO BIDDERS

Water Plaza at Mega-10 Park
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.

ARTICLE 1—BID SECURITY

1.01 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).

1.02 Bid security other than said bid bond shall be in accordance with Chapter 26 of the Iowa Code.

1.03 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".

1.04 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.

ARTICLE 2—SUBMISSION OF THE PROPOSAL AND IDENTITY OF BIDDERS

2.01 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.

2.02 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.

2.03 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.

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2.04 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.

2.05 Division 1 - General Provisions and Covenants of the 2024 SUDAS Standard Specifications is modified as follows:

A. Section 1020.1.09B, Unit Price Attachment.

A computer-generated unit price attachment may be submitted by the Bidder as specified by this section.

ARTICLE 3—PROSECUTION AND PROGRESS OF THE WORK

3.01 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.

3.02 Community Events.

Successful Bidder will be required to coordinate with the Jurisdiction and accommodate the Jurisdiction's requirements for the following list of events:

None

3.03 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.

3.04 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.

ARTICLE 4—PREFERENCE OF PRODUCTS AND LABOR

4.01 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.

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ARTICLE 5—TAXES

5.01 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.

5.02 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.

5.03 Income Tax:

A. Successful Bidder is subject to payment of Iowa income tax on income from this work in amounts prescribed by law.

B. 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.

ARTICLE 6—ADDITIONAL ITEMS

6.01 Pre-Bid Conference (If pre-bid is held, should be added to the Notice to Bidders after last item.)

A. A pre-bid conference <u>will not</u> be conducted for this Project.

6.01 Other Site-Related Documents

A. List of documents available to Bidders:

1. Geotechnical Report
2. City of Marshalltown Supplemental Specifications

B. Owner will make copies of these other site-related documents available to any Bidder on request.

C. Owner has not verified the contents of these other site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other site-related documents.

D. The other site-related documents are not part of the contract documents.

E. Bidders are encouraged to review the other site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary site information is limited to information in (1) the contract documents and (2) the technical data.

******END OF SECTION******

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SECTION 00410 - PROPOSAL

Water Plaza at Mega-10 Park
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 Water Plaza at Mega-10 Park.

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

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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. 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.

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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

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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

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.

_____
Bidder

_____
Signature

_____
Name (Print/Type)

_____
Title

_____
Street Address

_____
City, State, Zip Code

_____
Telephone Number

_____
E-Mail Address

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.

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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**

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 bidders who are residents? ☐ 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 reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

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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.

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PROPOSAL ATTACHMENT: PART C – BID ITEMS AND QUANTITIES

Water Plaza at Mega-10 Park
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.

ESTIMATED PROJECT QUANTITIES					
ITEM NO.	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL**
1	CLEARING AND GRUBBING	LS	1		
2	TOPSOIL, ON-SITE	CY	850		
3	TOPSOIL, COMPOST AMENDED	CY	90		
4	EXCAVATION, CLASS 10	CY	1960		
5	SUBBASE, TEMPORARY GRANULAR MATERIAL	SY	1615		
6	SUBBASE, MODIFIED, 4 INCHES	SY	520		
7	SUBBASE, MODIFIED, 24 INCHES	SY	929		
8	REMOVAL OF STRUCTURE, SANITARY LIFT STATION MANHJOLE	EA	1		
9	COMPACTION TESTING	LS	1		
10	SANITARY SEWER SERVICE	EA	2		
11	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	305		
12	STORM SEWER, TRENCHED, RCP, 24 INCH	LF	8		
13	LINEAR TRENCH DRAIN (LEAPING JET TROUGH)	LS	2		
14	PIPE APRON, RCP, 15 INCH	EA	1		
15	PIPE APRON, RCP, 24 INCH	EA	1		
16	SUBDRAIN, HDPE, 4 INCH	LF	220		
17	SUBDRAIN CLEANOUT, 4 INCH	EA	2		
18	WATER SERVICE PIPE, PVC, 2 INCH	LF	363		
19	WATER SERVICE PIPE (TRENCHLESS), PVC, 2 INCH	LF	230		
20	WATER SERVICE ABANDONMENT	EA	1		

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
21	TAPPING VALVE ASSEMBLY, 2 INCH	EA	1		
22	PACKAGE GRINDER LIFT STATION	EA	1		
23	WATER MAIN MANHOLE, SW-401	EA	1		
24	STORM SEWER OUTLET STRUCTURE	EA	1		
25	STORM MANHOLE, SW-402	EA	1		
26	SW-512, 18"	EA	1		
27	PAVEMENT, PCC, 5 INCH	SY	370		
28	PAVEMENT, PCC, 6 INCH REINFORCED (WET DECK)	SY	820		
29	NON-SKID RUBBERIZED COATING	SF	3290		
30	PCC PAVEMENT SAMPLES AND TESTING	LS	1		
31	REMOVAL OF SIDEWALK	SY	135		
32	FULL DEPTH PATCHES, PCC, 7 INCH	SY	23		
33	TEMPORARY TRAFFIC CONTROL	LS	1		
34	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 1 - PERMANENT LAWN	AC	0.59		
35	SOD	SQ	115		
36	PLANTS WITH WARRANTY, PERENNIAL GROUND COVER, (1 GAL)	EA	826		
37	PLANTS WITH WARRANTY, DECIDUOUS TREE	EA	7		
38	SWPPP PREPARATION	LS	1		
39	SWPPP MANAGEMENT	LS	1		
40	FILTER SOCK/WATTLE	LF	1150		
41	RIP RAP, CLASS E	TON	20		
42	SILT FENCE OR SILT FENCE DITCH CHECK	LF	200		
43	INLET PROTECTION DEVICE	EA	1		
44	END OF SEASON TEMPORARY EROSION CONTROL	AC	1		
45	DEMOLITION WORK - EXISTING RESTROOMS	LS	1		
46	MOBILIZATION	LS	1		

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ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
47	CONCRETE WASHOUT	LS	1		
48	FREESTANDING RINSE STATION	LS	1		
49	RESTROOM	LS	1		
50	BENCH TYPE 1 (CURVED BENCH, SINGLED SIDED)	EA	3		
51	BENCH TYPE 2 (CURVED BENCH, DOUBLE SIDED)	EA	1		
52	BENCH TYPE 3 (METAL BACKED BENCH)	EA	5		
53	LITTER RECEPTACLE	EA	2		
54	CONCRETE PEBBLE	EA	3		
55	DECORATIVE METAL PANEL	LF	155		
56	DECORATIVE ACRYLIC PANEL ATTACHMENT	LS	1		
57	SIGN TYPE 1 (PARK SIGN)	LS	2		
58	SIGN TYPE 2 (DONOR SIGN)	LS	1		
59	SIGN TYPE 3 (DONOR STORY SIGN)	LS	1		
60	BIKE RACK	EA	6		
61	WATER FEATURE AND TREATMENT SYSTEM	LS	1		
62	SCULPTURE FOOTING	LS	1		
63	ELECTRICAL CONDUIT/WIRING	LS	1		
				TOTAL AMOUNT:	

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

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SECTION 00420 - BID BOND

Water Plaza at Mega-10 Park
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: Water Plaza at Mega-10 Park

Project Description: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that gernerally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid itmes include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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 Marshall 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.

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Signed and sealed this _____ day of _____, 20_____.

SURETY:	PRINCIPAL:
_____	_____
Surety Company	Bidder
By: _____	By: _____
Signature Attorney-in-Fact/Officer	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.

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SECTION 00500 - CONTRACT

Water Plaza at Mega-10 Park
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 Water Plaza at Mega-10 Park 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: Water Plaza at Mega-10 Park

Project Description: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that gernerally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid itmes include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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 9/15/2025, and completed and ready for final payment in accordance with General Conditions on or before 11/15/2025.

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B. Liquidated Damages

1. Pay liquidated damages for noncompliance with said completion provisions in the amount of Three Hundred Dollars ($300.00) for each calendar day the work remains incomplete.

2. 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 Jurisdiction Three Hundred Dollars ($300.00) for each calendar day that expires after such time until the Work is completed and ready for final payment.

3. Liquidated damages for failing to timely attain Substantial Completion and Final Completion are not additive and will not be imposed concurrently.

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.

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IN WITNESS WHEREOF, the Parties hereto have executed this instrument, in triplicate on the date first shown written.

JURISDICTION: City of Marshalltown

By: _____
Joel Greer, Mayor

(Seal)
ATTEST:

By: _____
Alicia Hunter, Clerk

CONTRACTOR:

_____
Company Name

_____
Signature

_____
Name (Print/Type)

_____
Title

_____
Street Address

_____
City, State, Zip Code

_____
Telephone

_____
E-Mail

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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_____

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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_____

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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

Water Plaza at Mega-10 Park
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 Obligee (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 Water Plaza at Mega-10 Park, Marshalltown, Iowa.

Project Description: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that gernerally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid itmes include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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.

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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 Marshall 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

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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.

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Project No. _____

(CON'T – PERFORMANCE, PAYMENT AND MAINTENANCE BOND)

Witness our hands, in triplicate, this _____ day of _____, 20_____.

SURETY:	PRINCIPAL:
_____	_____
Surety Company	Bidder
By: _____	By: _____
Signature of Attorney-in-Fact/Officer	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:

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.

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SECTION 00800 - SPECIAL PROVISIONS

FOR

Water Plaza at Mega-10 Park
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., 401 E Grand Ave, Suite 101, Des Moines, IA 50309.

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.

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(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.

4) WORK REQUIRED

a) Work under this Contract includes all materials, equipment, transportation, traffic control, and associated work for the construction of the Water Plaza at Mega-10 Park 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).

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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) None.

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.

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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.

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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 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 STAKING

a) Unless otherwise specified in the specific sections, Jurisdiction shall provide engineering surveys to establish reference points for construction as follows:

i) Storm Sewer: Staking will be furnished and set by the Engineer at 50.0-foot spacing (usually offset for construction) for the control of the underground construction herein described. Cuts to the proposed pipeline grade will be furnished by the Engineer. Manholes and catch basins will be staked with an offset and a witness with a cut to the lowest structure invert.

ii) Watermain: The staking interval for watermain shall be 25.0-feet. Cuts to the proposed pipeline grade will be furnished by the Engineer. Location staking shall be provided for valves and fittings. Hydrants will be staked with an offset and a witness with a cut to the ground elevation at the hydrant. The Engineer will provide horizontal and vertical control points on the project's datum.

iii) Street Grading, Form Grade and Top of Curb: A control line (usually offset from the curb line) with cuts and fills to proposed grade at 50.0-foot spacing on tangents, and 25.0-foot spacing on horizontal or vertical curves, shall be furnished and set on both sides for control of the construction herein described.

iv) Concrete Paving: Control lines for paving forms or stringline control with cuts and fills to proposed finished grade at 25.0 or 50.0-foot stations shall be furnished and set by the Engineer for control of the concrete construction herein described. The offset and actual form or stringline locations shall be in accordance with the paver manufacturer's recommendations and the approved paving strategy as determined at the preconstruction conference.

b) The Engineer will provide stakes indicating the right of way and/or temporary easement construction limits.

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c) Contractor is responsible to have all areas where stakes need to be set to be clear of debris. The Contractor needs to also provide a clear line of sight for staking.

d) The Contractor shall submit staking requests a minimum of two (2) working days, excluding Saturdays, Sundays and legal holidays, prior to the date requested stakes are needed on the project. Staking requests submitted after 2pm shall be recorded as being received the next business day.

e) The stakes are an integral part of the project and the Contractor shall protect and preserve all such stakes and marks and will be charged with the expense of resetting all such stakes and marks destroyed or disturbed due to the Contractor's carelessness or negligence. Stakes that are destroyed due to vandalism, erosion or other incidents shall be re-staked by the Engineer and will not be at the Contractor's expense.

f) In the event of apparent or questionable errors or inconsistencies in such stakes set for control of line and/or grade, the Contractor shall promptly notify the Engineer of such error or inconsistency and shall not proceed with the work until such stake, grade or mark shall have been verified or corrected by the Engineer.

g) The Engineer will mark the existing boundary monuments prior to construction. The Contractor is responsible for protecting the monuments during construction. If monuments are removed, the Engineer will reset them post construction at the Contractor's expense.

h) All other line and grade staking shall be the responsibility of the Contractor. The Contractor shall furnish sufficient equipment and personnel for determination of plan grades, cross sections, course thicknesses, etc. The survey cost of establishing stakes requested by the Contractor for the convenience of the Contractor, beyond those cited as basic project control, will be charged to the Contractor, or withheld from the amounts due to the Contractor.

19) 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) Survey work documentation shall be a combination of digital and hard copy format and is the property of the Engineer.

d) 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.

e) When survey work is done under traffic conditions, the traffic control shall be in place prior to commencement of survey work.

f) The Engineer will have a representative at the preconstruction conference to discuss construction staking.

g) The Jurisdiction and Engineer will not be responsible for delays due to lack of grade or line stakes unless the Contractor has given the Engineer a 48 hour, working day, notice that such stakes will be needed and the Contractor's work is being conducted in a satisfactory manner and at the specified rate of progress.

20) 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. Required testing not specified as Contractor or Supplier responsibility will be completed by an independent testing laboratory retained by the Jurisdiction or the Engineer.

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.

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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.

21) SOIL BORINGS

a) Reference Geotechnical report provided.

22) 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.

23) 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.

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24) 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.

25) 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.

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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.

26) 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.

27) 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.

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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.

28) 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.

29) 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

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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******

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SECTION 00900 - NOTICE OF AWARD

(To be executed after bid is awarded.)

TO: Contractor

Address 1

Address 2

City, State, Zip

PROJECT TITLE: Water Plaza at Mega-10 Park

PROJECT DESCRIPTION: This project, at approximate 1.5 AC of disturbed area, includes a paved public plaza that gernerally consists of a multi-zoned recirculating system of nearly 50 water features and jets powered by five (5) 5 horsepower pumps. The pumps and other equipment for the recirculating system are housed within a pump room in a new prefabricated restroom facility as well as in a new below-grade concrete surge tank nearby. The project includes amenities and custom features throughout, including the fabrication and installation of a custom sculpture designed by a local artist to be fabricated and installed by the artist's preselected fabricator, custom interpretive signage, multiple types of site furnishings, lighting and power pedestals, an outdoor rinse station, plantings and other custom elements. Other major bid itmes include approximately 1300 SY of modified subbase, 300 LF of trenched storm sewer, 200 LF of subdrain, 360 LF of trenched water service pipe, 230 LF of trenchless water service pipe, 1200 SY of 5-inch PCC pavement (including some reinforced), 3300 SF of non-skid rubberized coating, pavement removal, and turf restoration. Please refer to the bid form and plan set for additional bid items and other information about the project.

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: _____

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ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____,

this, the _____ day of _____, 20_____.

BY: _____

TITLE: _____

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SECTION 00910 - NOTICE TO PROCEED

(To be executed after Agreement, Bonds and Insurance Certificates are approved.)

TO:	Contractor	Date:	
	Address 1	Project Title:	Water Plaza at Mega-10 Park
	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: _____

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TS1 – FAMILY STYLE RESTROOM – SHOWER BUILDING

PART 1: GENERAL

1.1 SCOPE

A. Construction and onsite placement of a prefabricated precast concrete family style restroom – shower building.

1.2 MANUFACTURER

A. Manufacturer shall be Huffcutt Concrete or a pre-approved equal.

1. Contact Reed Sorensen 4154 123rd Street Chippewa Falls, WI 54729
   Direct: 715-438-6245

B. Manufacturer shall be an NPCA Certified Plant or equal with verifiable references demonstrating quality, design, and service upon request.

C. Manufacturer will provide a written warranty providing 20 years structural, manufacturer's warranty on all hardware and components not produced at precast concrete manufacturer's plant, and 3 years against defects in paint, caulk, and grout.

D. Manufacturer shall guarantee delivery and installation on or before August 1, 2024.

1.3 DESIGN

A. Building will be manufactured using precast concrete including the roof. Building's structural and foundation design will be relevant to the region and properties associated with its final placement and provided by the Engineer. Design will also meet ADA and building code requirements.

B. Building customizations to the Hickory Model, see plan sheets for required customization. Shop drawings required and to be approved by Landscape Architect.

1.4 SUBMITTALS

A. Manufacturer shall provide submittals and engineering if requested.

PART 2: PRODUCTS

2.1 MATERIALS

A. Doors and Frames

1. Doors shall be 18ga galvanized metal, louvered with 16ga frames. Doors and frames shall include one coat of rust inhibitive primer and two finish coats of enamel paint.

B. Door Hardware

1. Aluminum drip cap. Reese or equal.
2. Door closure with hold open. Cal-Royal or equal.
3. Stainless hinges with non-removable pin. Cal-Royal or equal.
4. Grade 1 lockset. Function and keying to be verified with owner.
5. Brush style sweep. Reese or equal.
6. ADA compliant threshold. Reese or equal.

C. Windows

1. Vinyl frame, obscure glass, non-operable. Parco or equal.

D. Plumbing

1. Stools
   a. Kohler porcelain wall mounted, ADA compliant, elongated bowl.
   b. Sloan flush valve, concealed, hydraulic actuator.
2. Urinal
   a. Kohler porcelain wall-mounted, ADA compliant.
   b. Sloan flush valve, concealed, hydraulic actuator.
3. Lavatories
   a. Kohler wall mounted sink, ADA compliant.
   b. Moen single handle ADA metering faucet.
4. Water Heater

a. Bradford white electric water heater. Size to be sufficient for number of showers and lavatories.

5. Mixing Valve
   a. Honeywell thermostatic mixing valve, adjustable.
6. Shower
   a. Acorn Penal-Ware Series, ADA compliant.
7. Floor Drains
   a. Sioux Chief on grade adjustable floor drain.
8. Sediment Filter
   a. Rusco sediment filter.

E. Electrical

1. Interior
   a. RAB Vandal-proof Tuff Dome motion sensor.
   b. RAB VAN1 lights.
   c. GFI receptacles.
   d. Murdock super secure.
2. Exterior
   a. RAB Tallpack lights.
   b. (2) GFI receptable with weather-proof, lockable covers. One shall be place high to power a wifi extender and one shall be at standard height.
3. Chase
   a. 100amp loadcenter.
   b. (2) 2 bulb florescent lamps. (1 per modular section)
   c. Solar & Palau exhaust fan.

F. Interior Hardware

1. Stainless 3 roll toilet paper dispenser.
2. ADA toilet stalls shall have (1) 18” stainless vertical grab bar, (1) 36” stainless horizontal grab bar, (1) 42” stainless horizontal grab bar.

3. ADA showers shall have (1) 18” stainless vertical grab bar, (1) 30” stainless horizontal grab bar, (1) 42” stainless horizontal grab bar.
4. Stainless frame 18” X 36” mirror.
5. Bradley ADA compliant reversible phenolic shower seat.
6. (2) coat hooks.

G. Sealers

1. Floor shall be sealed using a deep penetrating, high alkali resistant, low volatility product. TK-290 or equal.

H. Caulks and Grout

1. All joints between precast panels shall be caulked using a durable, flexible polyurethane sealant. BASF Sonolastic NP-1 or equal.
2. Weld plate panel connections shall be grouted flush with interior wall surface. Speed Crete Red Line or equal.

2.2 FINISHES

A. Interior

1. Smooth trowel finish.

B. Exterior

1. Exterior wall appearance to be approved by owner using an architectural form liner.
2. Roof shall be cedar shake architectural form liner.

C. Paint

1. Interior

a. Wall panels shall be primed with a premium quality water based acrylic bonding primer moisture and alkali resistant. Finish coat shall be a high-performance acrylic enamel.

2. Exterior

a. Roof shall be covered with a quality 100% acrylic satin paint. Owner to determine color.

b. Walls shall be covered with a quality concrete stain. Owner to determine color.

c. Doors shall be covered using 2 coats of a high-performance 100% acrylic satin enamel. Owner to determine color.

PART 3: EXECUTION

3.1 PRECAST CONCRETE FAMILY STYLE RESTROOM – SHOWER BUILDING

A. Building manufacturer shall construct, assemble, paint, install plumbing and electrical at their plant so that it may be transported to the jobsite in finished modules and placed using a crane.

B. Building manufacturer shall provide mechanical rough in drawings showing where electrical, water supply line, waste line, and floor drains are to be located for hook up to building.

C. Contractor will make final mechanical connections after the building is placed by manufacturer.

D. Manufacturer will caulk interior and exterior seams between modules. Manufacturer will also perform any shipping and handling repairs during installation.

3.2 ONSITE

A. Contractors shall provide adequate access and a level pad for the crane and semis to sit side by side under their own power. Working radius shall be 35’ from center pin on crane.

B. Contractor shall install the foundation per plans.

C. Foundation shall be level to within ¼”.

D. Contractor shall rough in mechanicals according to mechanical rough in drawing provided by building manufacturer. Mechanicals shall be terminated at top of foundation. Final mechanical connections shall be done by contractor including floor drains.

TS2 - NON-SKID RUBBERIZED COATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A Non-Skid Rubberized Coating (Water Plaza)

1.2 MEASUREMENT AND PAYMENT

B Non-Skid Rubberized Coating (Water Plaza) will be measured and paid for by the square foot (SF). The item includes all labor, materials, and equipment necessary for furnishing and complete application of non-skid rubberized coating. Measurement and payment shall be per square foot of coating as specified on the drawings. All surface prep and priming coats are considered incidental.

1.3 RELATED SECTIONS

A 01 70 00 User General Requirements for Spray Grounds
B 13 11 14 User Waterstop for Spray Grounds
C 13 11 00 - Splash Pads
D 13 11 15 User Cast-In-Place Concrete for Spray Grounds

1.4 REFERENCES

American Society for Testing and Materials (ASTM):

1. ASTM D4541-95 Pull Off Adhesion Tests
2. ASTM-F-510 Wear Testing
3. ASTM-D-2794 Impact Resistance
4. ASTM-F-609 Coefficient of Friction Test

1.5 SYSTEM DESCRIPTION

Performance requirements: Provide a single pack, water based, cross linked, UV resistant polyurethane coating which cures in to a tough, textured coating with abrasion, chemical resistance and non-slip properties.

1.6 SUBMITALS

A. General: Submit listed submittals in accordance with Condition of the Contract and Division 1 Submittal Procedures Section.

B. Product Data: Submit manufacturers product data and installation instructions.

C. Submit manufacturers standard verification samples of 9" x 9" minimum.

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D. Quality Assurance/Control Submittals: Submit Certificate of qualifications of the flooring surface installer.

E. Closeout Submittals: Submit the Warranty documents specified herein.

1.7 QUALITY ASSURANCE

A. Qualifications: Utilize an installer approved and trained by the manufacturer of the flooring surface system, having experience with other projects of the scope and scale of the work described in this section.

B. Certifications: Certification by manufacturer that installer is an approved applicator of the flooring system.

1.8 DELIVERY, STORAGE, & HANDLING

A. General: Comply with Division 1 Product Requirement Section.

B. Delivery: Deliver materials in manufacturers original, unopened, undamaged containers with identification labels intact.

C. Storage & Protection: Store materials protected from exposure to harmful environmental conditions and at a minimum temperature of 40 degrees F (4 degrees C) and a maximum temperature of 90 degrees F (32 degrees C).

1.9 PROTECTIVE/SITE CONDITIONS

Environmental Requirements: Install flooring surface system when minimum ambient temperature is 40 degrees F (4.4 degree C) and maximum ambient temperature is 90 degrees F (32 degrees C). Do not install in steady or heavy rain or freezing conditions.

1.10 WARRANTY

A. TuffCoat application shall be warranted by the Contractor for 2 years from the date of final acceptance. The product shall be installed in accordance with manufacturer specifications, requirements, and recommendations. The Contractor is responsible for securing the site during the installation process to prevent premature access on the surface during cure times. LIMITED WARRANTY warrants the product is free from manufacturing defects and failure. Warranty to cover the workmanship performed by a person or firm installing the product. The Contractor warrants that the product is free of defects or failures due to improper application, including mud-cracking, flacking, or early signs of wear. The warranty does not cover damage due to vandalism, acts of God, or failure to maintain the TuffCoat in accordance with the manufacturer's recommendations and specifications.

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PART 2 - PRODUCTS

2.1 NON-SKID COATING SYSTEM

A. Manufacturer:

Tuff Coat Rubberized Non-Skid Coatings
2220 US HWY 70 SE, STE 100
Hickory, NC 28602
Telephone: (877) 252-9457; Fax: (970) 240-8963
Website: www.tuffcoat.net

Proprietary Products/Systems

Non-Skid Flooring system, including the following:

1. Primer
   a. UT-80 Adhesion Primer by TuffCoat
2. Non-Skid Rubberized Coating Type 1:
   a. UT-200, Submersible Medium Texture
   b. Color: UT-213, medium gray.
   c. Physical samples to be provided for approval.
3. Non-Skid Rubberized Coating Type 2:
   a. UT-200, Submersible Medium Texture
   b. Color: UT-210, light blue.
   c. Physical samples to be provided for approval.

2.2 PRODUCT SUBSTITUTIONS

Substitutions: No Substitutions Permitted.

2.3 MIXES

A. Required mix proportions by weight: 31-60% Urethane/Acrylic Copolymer; 10-29% Rubber Crumb; 31-60% Water.

PART 3 EXECUTION

3.1 MANUFACTURERS INSTRUCTIONS

A. Comply with the instructions and recommendations of the manufacturer of the coating system. Nothing in this specification precludes the contractor from complying with the manufacturer's recommended procedures for application of the coatings.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify that substrate conditions are suitable for installation of the: flooring system.

B. Do not proceed with installation until suitable conditions are corrected.

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3.3 PREPARATION OF CONCRETE

A. Concrete Cleaning

1. Clean and degrease all surfaces with Zep Purple Degreaser or similar. Do not use any solvent base products to clean any surface that receives the Tuff Coat.

B. Concrete Finish

1. The concrete should be hand troweled, with a brush/broom finish to ensure adequate porosity for adhesion. New concrete needs at least 28 days to cure properly, prior to primer application. Unless the new concrete is dry, adhesion problems will be experienced.

2. To make concrete porous then acid etching or shot blasting is necessary. Make sure to use a light acid etch using 2 parts muriatic acid to 1-part water and to remove all remaining acid with soap and water and scrub brush. (If all acid is not properly removed, you will not obtain adhesion).
3. Concrete should be completely clean and dry.
4. Patch all imperfections, cracks, etc., with concrete patch filler and flexible joint fillers. DO NOT USE SILICONE PRODUCTS. The Product will not adhere to silicone.
5. Prime with CP-10 as per manufacturer's instructions. When primer has properly cured, perform test patch to insure adhesion.

3.4 INSTALLATION

A. Types of Applications.

1. Roller Application
   a. Use Tuff Coat Texture Roller, only available from Tuff Coat Manufacturing Inc or a Tuff Coat Distributor. Other rollers may not pick up and spread the product evenly. The roller must be capable of lifting the rubber crumb within the product, to the surface. This will not occur using soft paint rollers.
   b. Soak roller in water - remove excess water prior to application.
   c. Roll Tuff Coat directly from a 5-gallon bucket. Make sure to completely saturate roller with product, leaving no bare spots on roller.
   d. Apply the first coat as a thin coat. Re-saturate roller each pass. Make 4 - 5 consecutive passes in the same direction, with each pass right next to the other. When applying, roll in one direction first, then roll in the opposite direction in order to properly blend the product and create a uniform textured surface.
   e. Once an area is covered, run the roller very lightly over it to ensure even distribution and blending of color and rubber crumb.
   f. When touch dry, apply two further subsequent coats.
   g. Do not apply too thick to avoid "mud cracking".

2. Spray Application

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a. Mask off area as needed

    a. Use only the spray gun recommended or supplied by Tuff Coat. Superior brand "Spraying Mantis" hand held Hopper gun or equivalent. Or for larger projects
    b. Graco brand "Tex-Spray Compact" or equivalent

b. Attach spray gun to a compressor airline giving pressure of at least 40 psi.
c. Spray water out of the gun to prime.
d. Before starting the job, spray a few short bursts away from the surface to test that everything is working properly.
e. Holding gun approximately 12-24" away from surface, spray an even, light coat over the entire surface. DO NOT APPLY TOO THICK.
f. Keep spray gun at a 90-degree angle to the surface.
g. Spray gun should make a slight "spitting" sound. This is a characteristic of the guns and is necessary for an even texture. The product will self-level.
h. When surface becomes touch dry, spray subsequent coats.
i. While spraying, be careful not to blow rubber crumb away from the area you are working on as this can accumulate in other areas of the job and prevent the polyurethane from bonding with the substrate.
j. If the rubber is bouncing back at you, lower the pressure or hold the gun further from the surface.
k. The further away from the surface you hold the gun, the greater the texture, the closer, the finer.
l. Remove any overspray immediately with cloth and water.

B. Application Temperature and Curing Time

1. Under normal working conditions the product will be touch dry within 1 hour and can be subjected to light foot traffic within 24 hours. Full curing time only affects the amount of time required to wait before subjecting the surface to cleaning, heavy loads and chemical exposure. Surface can be subjected to normal loads well before this minimum time requirement.
2. The coating should not be subjected to cleaning, heavy loads or chemical exposure until fully cured after 7 days, less in hot-humid conditions, more in cold, dry weather. Dry times in this manual are based on a temperature of 77 degrees Fahrenheit and 50% humidity. The product should not be used under 40 degrees Fahrenheit. Do not allow product to freeze.
3. DO NOT USE ANY SOLVENTS, SOLVENT BASED ALCOHOLS, THINNERS OR LACQUERS, TO THIN THE PRODUCT.

3.5 PROTECTION

Protect the installed surface from damage resulting from subsequent construction activity on the site

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3.6 STORAGE AND REPAIR

A. To store partially used cans, seal can well (airtight) and place in cool, dry place. The contents should be usable for at least 12 months. DO NOT LET FREEZE.

B. The evaporation of the water within the product will cause the product to cure. If some water content has evaporated, reconstitution with clean water may restore product viability if the curing process within the can is not too advanced.

3.7 REPAIRING

In the event that the Product is damaged, it can easily be repaired, or over coated, due to self- bonding.

A. Remove all damaged product. Use a sharp knife as a utility knife to make a well-defined area such as a square and eliminate uneven edges

B. Sand area with 36 or 40 grit sandpaper so that the new application can get a good grip. Slightly bevel the edges of the existing product so that the new product can fill in the cutout area and go slightly onto the existing product.

C. Clean area with water.

D. Test for adhesion first, before completing job. Then apply the product to the affected area.

3.8 MAINTENANCE

A. Most general floor cleaners have been tested and will work well. Recommended examples include: Simple Green, TSP, Laundry Detergents, Citrus Orange Cleaners, Commercial Degreasers.

B. DO NOT USE BLEACH, BLEACH PRODUCTS OR CAUSTICS.

C. For best results, use a stiff bristled deck brush to agitate cleaner on the surface.

D. Rinse surface thoroughly to remove all residue.

E. Surfaces can also be cleaned with use of automatic scrubbers. These are machines which, in one pass, put down the washing solution, scrub the floor with a light pad, and vacuum up the dirty water. It should be pointed out that the pad pressure used in the scrubber must be light and need only be sufficient for the pad to make light contact with the floor.

F. Heavy scrubbing will negatively affect the coated surface.

*****END OF SECTION*****

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TS3 – CAST IN PLACE CONCRETE – EXPOSED VERTICAL WALLS

PART 1 -- GENERAL

1.1 SECTION INCLUDES

A. Reinforced cast-in-place concrete retaining wall (ramp)

B. Reinforced cast-in-place concrete wall (leaf seat walls)

1.2 MEASUREMENT AND PAYMENT

~~A.~~ SIGNAGE FOOTINGS as indicated on the plans, will be measured and paid for by the lump sum (LS) as described in the estimate reference notes. This item includes labor, materials and equipment to furnish materials and construct the concrete footings for the Sign Type 1, Sign Type 2, Sign Type 3, and Decorative Panel Walls. See B and S sheets for details and specifications. All items necessary for complete excavation, compaction, formwork, reinforcing, testing and placement of concrete, backfill, reinforcing ties to ramp surface pavement, and any other items required for complete construction of the walls are considered incidental to this item.

B. LINEAR TRENCH DRAIN (LEAPING JET TROUGH) as indicated on the plans, will be measured and paid for by the lump sum (LS) as described in the estimate reference notes. This item includes labor, materials and equipment to furnish materials and construct the linear trench trough at the leaping jets at the plaza entrance sidewalks. See B and S sheets for details and specifications. All items necessary for complete excavation, compaction, formwork, void forms, reinforcing, testing and placement of concrete, backfill and any other items required for complete construction of the walls are considered incidental to this item.

~~C.~~ SCULPTURE FOOTING as indicated on the plans, will be measured and paid for by the lump sum (LS)) as described in the estimate reference notes. This item includes labor, materials and equipment to furnish materials and construct the art sculpture column. See B and S sheets for details and specifications. All items necessary for complete excavation, compaction, formwork, void forms, reinforcing, testing and placement of concrete, backfill and any other items required for complete construction of the walls are considered incidental to this item.

1.3 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 and placement of concrete.

1.4 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.

1.5 SUBMITTALS

A. Product Data

1. Reinforcement
2. Supports for reinforcement
3. Forming accessories
4. Admixtures
5. Patching compounds

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6. Waterstops
7. Joint systems
8. Others items as requested by landscape architect.

B. Shop Drawings

1. Reinforcement: Submit original shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. The shop drawings shall be prepared only by competent detailers, checked by the contractor prior to submission.
   (a) The shop drawings shall show construction, contraction and isolation joint locations and the added reinforcement required at same.
   (b) Obtain and coordinate information for sleeves and openings in concrete, which are required for the work of other trades. Make coordinated drawings showing size and location of openings and sleeves and incorporate this information on the reinforcing drawings.
   (c) Only those splices indicated on the approved shop drawings will be permitted.
2. Provide elevations of all foundation walls and other structural elements to a minimum 1/4" scale.
3. Shop Drawings Formwork: Submit shop drawings for fabrication and erection of specific finished concrete surfaces. Show form construction including jointing, special form joint or reveals, location and pattern of form tie placement, and other items which affect exposed concrete visually. Architect's review is for general architectural applications and features only. Design of formwork for structural stability and efficiency is Contractor's responsibility, prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
   (a) Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
4. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   (a) Indicate amounts of mixing water to be withheld for later addition at project site.
5. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
   (a) Location of construction joints is subject to approval of the landscape architect.
6. Contraction Joint Layout: Indicate proposed contraction joints required per applicable codes and drawings.
   (a) Location of contraction joints is subject to approval of the landscape architect.

1.6 QUALITY ASSURANCE

A. Acceptable Installers

1. Installer shall have a minimum of five (5) years of experience pouring vertically formed architectural concrete. The manufacturer shall provide onsite review and inspection by a trained representative as required by this specification.

B. 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 on 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. 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.

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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:

1. Smooth form, free of defects.
2. Chamfer all exterior corners and edges.
3. Formwork to be installed so pattern is continuous in appearance and panel seams cannot be seen.
4. Evenly spaced rustication joints to be installed as indicated on the plans.

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 1/4-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. Release agent shall be used as recommended in the manufacturers 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 de-bonding agent on form surfaces, reinforcing steel and construction joints shall be removed before 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 finished concrete will conform to shapes, lines, grades, and dimensions indicated on 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 false work to support roof and floor slabs shall be designed for a loading of at least that required by ACI 347.

C. Contractor to submit shop drawings showing plan, elevation, and details to show the overall pattern with joint locations, form tie locations, and end, edge, and other special conditions.

D. Material Requirements

1. Form ties: Shall be made of either metal or fiberglass. Metal ties shall be designed to separate at least one inch back from the finished surface, leaving only a neat hole that can be plugged with patching material.

PART 3 -- EXECUTION

3.1 PRE-INSTALLATION REQUIREMENTS

A. Contractor to conduct a pre-installation meeting one (2) weeks in advance of construction of a full-scale mockup with the landscape architect and applicable subcontractors.

B. Mockup:

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1. Sign Footing Walls: Contractor shall construct a mockup onsite using the same materials, methods, and work force that will be used for the overall work. At the contractor's discretion and risk, the mockup may be requested to be incorporated into the final product, pending acceptance by Engineer and Owner on quality and workmanship.
   (a) Size: 50 sq. ft. or larger if needed to adequately illustrate workmanship and finish.
   (b) Include an area large enough to demonstrate surface finish and texture, rustication joints, chamfers, form ties, expansion joints if required, and other representative elements of the wall system.
   (c) Protect the mockup through substantial completion of the project.
2. Sculpture Column: Contractor shall construct a mockup onsite using the same materials, methods, and work force that will be used for the overall work.
   (a) Size: 5ft height minimum or larger if needed to adequately illustrate workmanship and finish.
   (b) Include an area large enough to demonstrate surface finish and texture, chamfers, form ties, and other representative elements of the column system.
   (c) Protect the mockup through substantial completion of the project.

3.2 CONSTRUCTION

A. Formwork - Contractor shall strictly follow all manufacturer procedures for handling, storage, installation, and removal of formwork. Forms shall be designed, constructed and maintained to insure that after removal of forms the finished concrete members will have true surfaces free of deformities, bulges or visible seams, 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.

B. Studs - Studs shall be spaced to prevent deflection of form material. Forms and joints shall be sufficiently tight to prevent leakage of grout and cement paste during placing of concrete. Joints in forms shall be arranged vertically or horizontally to conform to the pattern of the design. Insofar as practicable, juncture of formwork panels shall occur at architectural lines, vertical control joints, including alignment with masonry control joints, and construction joints. Forms placed on successive units for continuous surfaces shall be fitted to accurate alignment to assure smooth completed surfaces free from irregularities. Temporary openings shall be arranged in wall and column forms and where otherwise required to facilitate cleaning and inspection. Forms shall be readily removable without impact, shock or damage to the concrete.

C. External Corners - External corners of walls that will be exposed shall be chamfered by moldings placed in the forms unless the drawing specifically states that chamfering is to be omitted.

3.3 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 manner as to leave a hole extending through the interior of the concrete members. The use of snap-ties which 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 loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms, the rods shall remain embedded and shall terminate not less than 1-1/2-inch 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 bond. 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 a 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.

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3.4 CONCRETE PLACEMENT

A. Ready-mix concrete shall comply with the requirements of ASTM C 94 and ACI 304. All plant and transporting equipment shall comply with the concrete plant standards and truck mixer and agitator standards of the National Ready Mix Concrete Association.

B. Cold weather mixing procedures shall be submitted to the architect for approval.

C. Notify Architect and Owner's Inspector at least 36 hours (1 1/2 regular working days) before each pour so that forms and reinforcing may be examined. Do not place concrete until inspection has been made or waived.

D. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

   1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.

E. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.

   1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation. Segregated concrete sections are defective and will not be accepted.

F. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 18" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints. Use internal vibrators penetrating both the top and preceding layers.

G. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

H. Use and type of vibrators shall conform to ACI 309 "Recommended Practice for Consolidation of Concrete." Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

3.5 FORM REMOVAL

A. Form release agent: Apply following manufacturer's recommendations.

B. Form stripping and related construction shall avoid creating defects in the finished surface.

C. Forms shall be removed in a manner to ensure 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 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 expiration of curing period. Care shall be taken to avoid spalling the concrete surface or damaging concrete edges. Wood forms shall be completely removed.

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D. Supporting forms or shoring shall not be removed until 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 expiration of three-fourths of the proposed period before removal of the forms. Care shall be exercised to assure that the newly unsupported portions of the structure are not subjected to heavy construction or material loading.

E. Forms for all parts of the work not specifically mentioned herein shall remain in place for periods of time as determined by the ENGINEER.

F. Recommendations for shoring given in ACI 347 shall be followed for all re-shoring.

3.6 PROTECTION OF FINISHED WORK

A. Protect surface from damage throughout remainder of construction period until Final Acceptance of the work. If a covering material is necessary, surfaces must remain uncovered for a minimum of four days after which they may be covered with a new, smooth, nonstaining reinforced kraft curing paper. Plastic sheeting is unacceptable as a covering material.

****** END OF SECTION ******

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TS4 – PLANTINGS

*This specification amends Section 9030 of the 2023 Edition of the "Iowa Statewide Urban Design and Specifications" for public improvements as it pertains to the following bid items:

- Deciduous Shrubs
- Ornamental Tree
- Perennial Ground Cover (1 Gal.)
- Deciduous Tree
- Evergreen Tree

1.01 Measurement and Payment: Replace with the following.

1. Measurement: Each tree, shrub, groundcover or perennial plant accepted in place will be counted.

2. Payment: Payment will be at the unit price for each tree, shrub, or groundcover perennial plant. 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. 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, weeding control, pruning, and fertilizing, 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. A one-year warranty period will apply to all replacement plant material.

3. Includes: Unit price includes, but is not limited to, delivery, excavation, installation, watering, backfill, mulching, wrapping, staking or guying, herbicide, maintenance during establishment and warranty periods, and replacements.

2.01 Mulch: Replace with the following.

A. Finely shredded, double processed hardwood mulch.

B. Particle sizes ranging from 0.25-0.5 inch diameter and maximum 3 inches in length.

C. Green or freshly chipped or shredded mulch shall be rejected.

D. Mulch shall be free of weeds, weed seed, chaff, diseases, or other foreign material.

2.02 Backfill Material: Replace with the following.

A. Planting backfill shall consist of topsoil, compost amended as indicated on contract documents. See plan sheets for amended soil mix design.

B. Existing on-site soils may not be used as planting backfill.

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2.03 **Water:** Replace with the following.

A. Provide water and watering equipment such as hoses, tanks, reels, bags or bladders, mobile equipment, nozzles, and sprinklers for the purpose of regular watering activities during the establishment period. Provide water free of substances harmful to plant growth. No fertilizers, pesticides, or growth regulators will be used in the water.

B. For trees, provide slow-release watering system. Contractor is responsible for proper use of slow-release watering products per manufacturer and the health of the trees.

a. Products:

i. Preapproved product: Treegator Original
Manufacturer: Treegator
153 Mosswood Boulevard
Youngsville, NC 27596
Phone: 1-866-873-3428
Webpage: https://treegator.com/index.html

ii. Or approved equal.

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SECTION 01 70 00
GENERAL REQUIREMENTS FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Responsibility of cost of wet pit fill water and chemicals.

B. Water loss testing.

C. Demonstration and instruction of Owner personnel.

D. Operation.

E. Winterization requirements.

1.02 RELATED SECTIONS

A. Division 1 - General Requirements.

PART 2 PRODUCTS

2.01 WET PIT FILL WATER AND CHEMICALS

A. Cost of Fill Water: By Contractor.

B. Cost of chemicals required for start-up and operation: By Contractor.

PART 3 EXECUTION

3.01 WATER LOSS TESTING

A. After the wet pit has been filled and is operational, perform a water loss test on all water holding structures and piping systems. All testing shall be performed in company with the Owner and/or Engineer.

B. Testing procedures shall be as follows:

1. Run the recirculation system as well as all water feature systems under normal operating conditions.
2. Where exposed for viewing, check all water holding structures and piping systems for visible leaks. Report any leaks along with recommended repair procedures to the Engineer for review and approval. Upon approval, make the necessary repairs.
3. Turn off all water make-up systems.
4. Verify the water level in the surge tank is at normal operating level. Measure and record the surge tank water level from the top of the pit down to water level.
5. Place a five-gallon bucket, partially filled with water to offset it's buoyancy, within the wet pit structure such that the rim is above water level (this could be placed on a step, placed on or supported from the wet pit bottom, or somehow supported from above).
6. Fill the bucket with water to the exact level of the surrounding wet pit water. (The purpose of the water filled bucket is to measure losses due to evaporation. Water loss in the wet pit greater than that observed in the bucket indicates losses in excess of evaporation and

so it can be concluded that leakage exists.)

7. Mark the inside and outside of the bucket with a permanent marker at the water level.
8. Run the recirculation system as well as all water feature systems under normal operating conditions for a 24-hour period with the bucket in place.
9. After 24-hours, measure and record the surge tank water level from the top of the pit down to water level. Compare the results of the water level with that taken at the start of testing. Report these values to the Engineer for review. A substantial difference in these values indicate water loss.
10. Compare the water level in the bucket with the wet pit water level. Report these values to the Engineer. If the water level in the bucket and the wet pit water level are the same and the surge tank measurements above are not substantially different, then the test passed. If the wet pit water level is below the level of the water in the bucket, the test failed and a leak is present.
11. Repeat the above steps with the recirculation system and water feature systems turned off. Report all measurements to the Engineer. If the difference between the level of water in the bucket and the level of the wet pit water is less than that measured with the recirculation system on, then the leak is likely in the recirculation system. If the difference between the level of water in the bucket and the level of the wet pit water is the same as that measured with the recirculation system on, then the leak is most likely in the wet pit structure.

C. If testing indicates water loss or leakage, locate the source of water loss and report the source(s) and recommended repair procedures to the Engineer for review and approval. Once the repair procedures are approved, make the necessary repairs and perform the water loss testing procedures again.

3.02 DEMONSTRATION AND INSTRUCTION

A. Refer to spec section 017900 for all demonstration and training.

B. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.

3.03 OPERATION

A. For a period of 15 days after substantial completion, operate the recirculation, filtration, and chemical feed systems.

B. Operation shall include, but not necessarily limited to, the following:

1. Operation of the recirculation systems.
2. Backwashing the filters when required.
3. Maintaining appropriate levels of free available chlorine in the wet pit at all times.

4. Adjusting the water chemistry to maintain ideal water balance conditions. This includes monitoring and adjusting total alkalinity, calcium hardness, and pH.
5. Operation of all recirculation and feature pumps including adjusting flows as required for each system.

C. Maintain appropriate operating records.

D. After substantial completion, routine maintenance (e.g. vacuuming, cleaning the decks, cleaning the bathhouse, etc...), will be the responsibility of the Owner.

3.04 WINTERIZATION

A. Provide a qualified person who is knowledgeable about the Project to perform winterization and instruction of owner personnel.

B. Winterize the facility for the first season and instruct the Owner's personnel on the winterization of all equipment and piping systems. Provide written instructions on winterizing all facilities, including wet pit and bathhouse, and provide training of staff on winterizing procedures.

END OF SPEC SECTION 017000

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SECTION 10 14 46
CHEMICAL SIGNS FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Chemical signs.

B. Chemical caution signs.

C. NFPA hazardous materials signs.

1.02 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's descriptive literature for sign types specified, including components and accessories.

C. Shop Drawings: Indicate location of each individual sign in the project.

D. Manufacturer's Instructions: Printed installation instructions for each product.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements: Provide signs in accordance with regulatory authorities having jurisdiction.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products of this section in manufacturer's unopened packaging until installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Specified Manufacturer: Seton Identification Products; 20 Thompson Road, Branford CT 06405-2842; Telephone 203-488-8059, FAX 203-488-5973; Toll Free Telephone 800-243 6624, Toll Free FAX 800-345-7819.

B. Acceptable manufacturers:

1. Uline: www.Uline.com
2. Emedco: www.Emedco.com

2.02 SIGNS

A. Chemical Signs:

1. Product: Seton Style M34xx or M35xx.
2. Material: Tedlar Coated Plastic.
3. Size: 10 inches wide by 14 inches high.

B. Chemical Caution Signs:

1. Product: Seton Style M9157.
2. Material: Aluminum.

3. Size: 10 inches wide by 7 inches high.
4. Legend: "CAUTION CHEMICAL STORAGE AREA AUTHORIZED PERSONNEL ONLY".

C. NFPA Signs:
1. Material: Aluminum.
2. Colors: As required by National Firefighters Prevention Association (NFPA) #704-1996, Standard System for the Identification of the Fire Hazards of Materials.
3. Size: 15 inches square.

2.03 ACCESSORIES

A. Mounting Hardware: Brass screws.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to receive signs have been finished, and that finishes are dry and correctly cured.

3.02 INSTALLATION

A. Install signs in accordance with manufacturer's printed installation instructions.
B. Locate signs in accordance with regulatory authorities having jurisdiction.

3.03 SCHEDULES

A. General: Provide signs approved by the local fire officials which indicates that the contents are potentially dangerous.
B. Colors: As required by regulatory authorities having jurisdiction.
C. Sign Schedule:
1. Filter Building:
a. Chemical Sign for Sodium Hypochlorite: Wall Adjacent to Chemical Feeders.
b. Chemical Sign for Muriatic Acid: Wall Adjacent to Chemical Feeders.
c. Chemical Caution Sign: All Doors to Chemical/Filter Room.
d. NFPA Sign for Sodium Hypochlorite: All Doors to Chemical/Filter Room.
e. NFPA Sign for Muriatic Acid: All Doors to Chemical/Filter Room.

END OF SPEC SECTION 101446

SECTION 13 11 14
WATERSTOP FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provisions of waterstops embedded in concrete and spanning control, expansion, and/or construction joints to create a continuous diaphragm to prevent fluid migration.

B. Waterstops for pipe penetrations.

1.02 RELATED SECTIONS

A. Section 13 11 15 - Cast-in-Place Concrete for spray grounds.

1.03 REFERENCES

A. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension; 1998a.

B. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000.

C. ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness; 2000.

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Samples: Submit two waterstop samples, each 6 inches long.

C. Product Data: Submit data of complete physical properties.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Store waterstops under cover and elevated above grade to protect from oil, dirt, sunlight, and premature exposure to water.

PART 2 PRODUCTS

2.01 HYDROPHILIC WATERSTOPS

A. Manufacturers and Products:

1. Construction Joints:
   a. Greenstreak "Hydrotite" profile number CJ-0725-3K.
   b. Applications: Use at all construction joints where called for on the drawings.
   c. Acceptable manufacturers:
      1) Adeka: www.ocm-inc.com
      2) De Neef: www.gcpat.com
2. Penetrations:
   a. Greenstreak "Hydrotite" profile number DSS-0420.

b. Applications: Use at all pipe or other penetrations through water holding concrete structures.

c. Acceptable manufacturers:

1) Adeka: www.ocm-inc.com

2) De Neef: www.gcpat.com

B. The waterstop shall be a combination of chloroprene rubber and chloroprene rubber modified to impart hydrophilic properties.

C. The waterstop shall have a delay coating to inhibit initial expansion due to moisture present in fresh concrete.

D. Performance requirements as follows:

1. Chloroprene Rubber:

a. Tensile Strength, ASTM D 412: 1,300 psi minimum.

b. Ultimate Elongation, ASTM D 412: 400 percent minimum.

c. Hardness (Shore A), ASTM D 2240: 50 plus or minus 5.

d. Tear Resistance, ASTM D 624: 100 lb/inch minimum.

2. Modified Chloroprene (Hydrophilic) Rubber:

a. Tensile Strength, ASTM D 412: 350 psi minimum.

b. Ultimate Elongation, ASTM D 412: 600 percent minimum.

c. Hardness (Shore A), ASTM D 2240: 52 plus or minus 5.

d. Tear Resistance, ASTM D 624: 50 lb/inch minimum.

e. Expansion Ratio, Volumetric Change - Distilled Water @ 70 degrees F: 3 to 1 minimum.

2.02 ACCESSORIES

A. Hydrophilic Waterstops:

1. Provide Greenstreak Rubber Adhesive to secure "Hydrotite" to smooth, dry concrete.

2. Provide Greenstreak "Epoxy 7300" two component epoxy gel to secure "Hydrotite" to rough, wet (or dry) concrete.

3. Provide "Leakmaster LV-1" single component hydrophilic sealant to secure "Hydrotite" to rough, dry concrete.

4. Provide cyanacrylate adhesive (super glue) for all splices.

5. Provide "Leakmaster LV-1" as addition to cyanacrylate adhesive at all splices for added insurance.

PART 3 EXECUTION

3.01 INSTALLATION

A. Hydrophilic Waterstop:

1. Cut coil ends square (or at proper angle for mitered corners) with shears or sharp blade to fit splices together without overlaps.
2. Splices shall be sealed using cyanacrylate adhesive (super glue) and "Leakmaster LV-1".
3. Seal watertight any exposed cells of "Hydrotite" using "Leakmaster LV-1".
4. Follow approved manufacturer recommendations.

B. PVC and Hydrophilic Intersections:

1. Maintain continuity of waterstops at all intersections and transitions.
2. Joinery between PVC and "Hydrotite" shall be sealed using "Leakmaster LV-1".
3. Follow approved manufacturer recommendations.

END OF SPEC SECTION 131114

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SECTION 13 11 15

CAST-IN-PLACE CONCRETE FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Elevated concrete slabs.

C. Floors and slabs on grade.

D. Concrete reinforcement.

E. Joint devices associated with concrete work.

F. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 13 11 14 - Waterstops for spray grounds

1.03 REFERENCE STANDARDS

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).

B. ACI 224R - Control of Cracking in Concrete Structures; 2001.

C. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.

D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).

E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.

F. ACI 304.2R - Placing Concrete by Pumping Methods; 1991.

G. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).

H. ACI 309R - Guide for Consolidation of Concrete; American Concrete Institute International; 1987.

I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.

J. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2012.

K. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 1999a.

L. ASTM C 31 - Making and Curing Concrete Test Specimens in the Field; 2000.

M. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2011a.

N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2012.

O. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2011b.

P. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2010a.

Q. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

R. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2010b.

S. ASTM C 231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method; 1997.

T. ASTM C 1064 - Test Method for Temperature of Freshly Mixed Portland Cement Concrete; 1999.

U. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data:

1. Submit data on formwork, reinforcing, and reinforcing accessories.
2. Submit data on all concrete materials including cement and fine and coarse aggregates. Testing shall be completed by an independent testing agency and shall be less than 12 months old. The costs for material tests shall be paid for by the Contractor.
3. Submit data on all admixtures and concrete accessories.
4. Submit concrete mix design.

C. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

1.05 DESIGN OF FORMWORK

A. Design and engineering of formwork, as well as its construction shall be the responsibility of the Contractor and shall comply with chapters 2 and 3 of ACI-347, and applicable requirements of the controlling local building code.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Acquire cement from same source and aggregate from same source for entire project.

C. Cold Weather Concreting: Cold weather concreting shall comply with ACI 306R.

1. The temperature of concrete at the time of placement shall be as follows:
   a. Section size (minimum dimension) less than 12 inches: 55 to 75 degrees F.
   b. Section size (minimum dimension) 12 to 36 inches: 50 to 70 degrees F.

2. The concrete temperature shall be maintained above the minimum identified above for a period of 6 days after placement.

D. Hot Weather Concreting: Except as modified herein, hot weather concreting shall comply with ACI 305R.

1. At air temperatures of 90 degrees F or above, concrete shall be kept as cool as possible during placement and curing. The temperature of the concrete when placed in the work shall not exceed 90 degrees F.
2. Plastic shrinkage cracking due to rapid evaporation of moisture shall be prevented. Concrete shall not be placed when the evaporation rate (actual or anticipated) equals or exceeds 0.2 pound per square foot per hour, as determined by Figure 2.1.5 in ACI 305R.

E. Concrete materials shall be selected and concrete shall be proportioned, handled, placed, and cured in a manner that will minimize shrinkage and cracking in accordance with Chapters 3 and 8 of ACI 224R. Concrete temperatures shall be controlled both before and after placement to minimize cracking. Any rise in concrete temperature caused by environmental conditions that will be conductive to excessive shrinkage shall be controlled with blankets or other acceptable means of insulation.

1.07 MOCK-UP

A. Construct a mock-up panel for each type of concrete surface finish for review and acceptance by Engineer.

1. Panel Size: Sufficient to illustrate finish required.
2. Mock-up panels shall include, but not necessary limited to, illustrating the following:
   a. Spray ground deck broom finish.

B. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.

C. Mock-up shall not remain as part of the Work.

PART 2 PRODUCTS

2.01 FORMWORK

A. 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 Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
2. Prefabricated: Simplex "Industrial Steel Frame Forms", Symons "Steel Ply", or Universal "Uni-form".
3. Plywood: Product Standard PS 1, waterproof, resin-bonded, exterior type Douglas fir, Panel Grade Designation B-B (concrete form), Class I.

4. Fiberboard: ANSI/AHA A135.4, Class 1, tempered, water-resistant, concrete form hardboard.
5. Lumber: Straight, uniform width and thickness, and free from knots, offsets, holes, dents, and other surface defects.
6. Chamfer Strips: Clear white pine, surface against concrete planed or Vinylex Corporation chamfer strips made from plastic material.
7. Radius Formers: Vinylex Corporation radius formers made from plastic material.
8. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
    a. Burke "Spectrum Release Agent", L&M Chemical "Debond", Master Builders "Pro Cote", Nox-Crete "Chembeton", or Symons "Thrift Kote".
9. Form Ties: Cone snap type, with 1-1/2 inch long cone and waterproofing washer, that will leave no metal within 1-1/2 inches of concrete surface.

2.02 SPECIAL CONCRETE TOOLS & ACCESSORIES

A. Slab Finish Strip:
1. Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal.
2. Size: 20-inches wide by length required with 1-inch break.
3. Use: For use during concrete finishing process to create straight line separation between slabs and to protect adjacent concrete slabs from fresh concrete.

2.03 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M Grade 60 (420).
1. Deformed billet-steel bars. Use plain billet-steel bars only where indicated on the drawings.
2. Finish: Unfinished, unless otherwise indicated.

B. Reinforcement Accessories:
1. Tie Wire: Annealed, minimum 16 gage.
2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
3. Precast Concrete Reinforcement Supports: Concrete supports that are not less than 4 inches square having a compressive strength equal to or greater than the specified compressive strength of the concrete being placed may be used for supporting reinforcing from the ground per ACI 301.
4. Provide stainless steel or all-plastic (no plastic-tipped components allowed) components for placement within 1-1/2 inches of surfaces exposed to weather or water.

2.04 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I - Normal Portland type.

1. Acquire all cement for entire project from same source.
2. Portland Limestone Cement (Type PLC or IL) per ASTM C595 and ASTM C1157 shall be allowed.

B. Fly Ash: Shall not be allowed.

C. Fine and Coarse Aggregates: ASTM C 33, unless modified herein.

1. Acquire all aggregates for entire project from same source.
2. Fine Aggregate:

a. Clean natural sand. Artificial or manufactured sand will not be acceptable.

b. Shall not contain any materials that are deleteriously reactive with the alkalies in the cement.

c. Sulfate Soundness Test: ASTM C 88.

1) Fine aggregate subjected to five cycles of the soundness test shall have a weighted average loss not greater than 10 percent when sodium sulfate is used or 15 percent when magnesium sulfate is used.

d. Organic Impurities Test: ASTM C 40.

1) Fine aggregate shall be free of injurious amounts of organic impurities.

2) Aggregates subjected to the test for organic impurities and producing a color darker than the standard shall be rejected.

e. Limits for Deleterious Substances:

1) Clay lumps and friable particle, ASTM C 142: 3.0 percent.

2) Materials finer than No. 200 sieve, ASTM C 117: 5.0 percent.

3) Coal and lignite, ASTM C 123: 0.2 percent.

f. Sieve Analysis (percent passing), ASTM C 136:

1) 3/8 inch: 100

2) No. 4: 95 to 100

3) No. 8: 80 to 100

4) No. 16: 50 to 85

5) No. 30: 25 to 60

6) No. 50: 15 to 30

7) No. 100: 3 to 10

g. Fineness Modulus, ASTM C 136: Shall not be less than 2.3 nor more than 3.1.

3. Coarse Aggregate:
   a. Crushed rock, washed gravel, or other inert granular material, having ASTM C 33 Class Designation 5S and as modified herein.
   b. Shall not contain any materials that are deleteriously reactive with the alkalies in the cement.
   c. Upper Limits for Deleterious Substances and Physical Property Requirements:
      1) Clay lumps and friable particles, ASTM C 142: 2.0 percent.
      2) Chert (less than 2.40 sp gr SSD), ASTM C 123: 0.5 percent.
      3) Material finer than No. 200 sieve, ASTM C 117: 1.0 percent.
      4) Coal and lignite, ASTM C 123: 0.2 percent.
      5) Abrasion, ASTM C 131: 50.
      6) Soundness Test, ASTM C 88:
         (a) Magnesium sulfate (5 cycles): 18 percent.
         (b) Sodium sulfate: 12 percent.
   d. Grading Requirements:
      1) Type A Concrete Mix Design: ASTM C 33, Table 2 Size Number: 67, which has the following gradation (percent passing):
         (a) 1 inch: 100
         (b) 3/4 inch: 90 to 100
         (c) 3/8 inch: 20 to 55
         (d) No. 4: 0 to 10
         (e) No. 8: 0 to 5
      2) Type B Concrete Mix Design: ASTM C 33, Table 2 Size Number: 8, which has the following gradation (percent passing):
         (a) 1/2 inch: 100
         (b) 3/8 inch: 85 to 100
         (c) No. 4: 10 to 30
         (d) No. 8: 0 to 10
         (e) No. 16: 0 to 5
4. Percentage of Fine to Total Aggregates: The ratio of fine to total aggregates, based on solid volumes (not weights), multiplied by 100 shall be based upon the following coarse

aggregate sizes:

a. For 1 inch maximum coarse aggregate size: Ratio of fine to total aggregates is 30% to 46%.

b. For 1/2 inch maximum coarse aggregate size: Ratio of fine to total aggregates is 40% to 55%.

D. Water: Clean and not detrimental to concrete.

2.05 CHEMICAL ADMIXTURES

A. No calcium chloride or admixture containing chloride from sources other than impurities in admixture ingredients will be acceptable. Admixtures classified as Class 1 or Class 2 in ACI 212R or containing any lignosulfonic acids ("lignins") or their salts will not be acceptable.

B. Air Entrainment Admixture: ASTM C 260.

1. Products:

a. Grace "Daravair" or "Darex".

b. BASF "MB-VR" or "MB-AE 90".

c. Sika Chemical "AER".

2. An air-entraining admixture shall be included in all concrete.

C. Chemical Admixtures: ASTM C 494/C 494M, Type A - Water Reducing, Type B - Retarding, and Type D - Water Reducing and Retarding.

1. Provide products manufactured by Grace, BASF, or Sika.

2. A water reducing admixture shall be included in all concrete.

3. A retarding admixture may be used only when approved by Engineer.

2.06 ACCESSORY MATERIALS

A. Non-Shrink, Non-Metallic Grout: ASTM C 1107, Grades A, B, C; premixed compound consisting of non-metallic aggregate and portland cement.

1. Minimum Compressive Strength at 28 Days: 7,000 psi.

2. Products:

a. Carter Waters "CW 100 Precision Grout".

b. BASF "Masterflow 713 Plus".

c. Dayton Superior "1107 Advantage Grout".

d. Sonneborn "Sonogrout 10K".

B. Epoxy Grout for Reinforcing Bars and Threaded Rod Anchors:

1. Adhesive: Moisture-insensitive.

a. For Floors and Horizontal Surfaces:

1) Low Viscosity Products:

(a) Hilti "HIT RE 500".

(b) Master Builders "Brutem AB (Parts A & B)".

(c) Sika "Sikadur 35, Hi-Mod LV" or "Sikadur 35, Hi-Mod LV LPL".

2.07 BONDING AND JOINTING PRODUCTS

A. Waterstops for spray grounds: See Section 13 11 14.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

1. For trial mixtures method, employ independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

D. Normal Weight Concrete, Type A:

1. Type A concrete shall be used at all locations unless noted otherwise.
2. Compressive Strength: The minimum acceptable compressive strength, when tested in accordance with ASTM C 39, shall be as follows:
   a. 7 days: 3,000 psi.
   b. 28 days: 4,000 psi.
3. Cement Content: Minimum 530 lb per cubic yard.
4. Water-Cement Ratio: Maximum 0.462 by weight.
5. Total Air Content: 6 percent plus or minus 1 percent, per ASTM C 173.
6. Slump: 3 inches plus or minus 1 inch.
7. Maximum Aggregate Size: 1 inch.

E. Normal Weight Concrete, Type B:

1. Type B concrete shall be used only at specific locations shown.
2. Compressive Strength: The minimum acceptable compressive strength, when tested in accordance with ASTM C 39, shall be as follows:
   a. 7 days: 3,000 psi.
   b. 28 days: 4,000 psi.
3. Cement Content: Minimum 628 lb per cubic yard.
4. Water-Cement Ratio: Maximum 0.462 by weight.
5. Total Air Content: 6 percent plus or minus 1 percent, per ASTM C 173.
6. Slump: 6 inches plus or minus 1 inch.
7. Maximum Aggregate Size: 1/2 inch.

2.09 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

1. Delivery Tickets:

   a. A delivery ticket shall be prepared for each load of ready-mixed concrete and a copy of the ticket shall be handed to the Contractor by the truck operator at the time of delivery before unloading at the site.

   b. Copies of delivery tickets shall be given to the Engineer upon request.

   c. Tickets shall indicate the following:

      1) Name and location of the concrete supplier.

      2) Serial number of ticket.

      3) Date.

      4) Truck number.

      5) Name of purchaser.

      6) Project name and location.

      7) Numerical sequence of the delivery.

      8) Specific class or designation of the concrete.

      9) Amount of concrete in cubic yards.

      10) Time loaded or of first mixing of cement and aggregates.

      11) Reading of revolution counter at the first addition of water.

      12) Type and brand and amount of cement.

      13) Type and brand and amount of admixtures.

      14) Information necessary to calculate the total mixing water added by the producer. Total mixing water includes free water on the aggregates, water, and ice batched at the plant.

      15) Maximum size of aggregate.

      16) Weights of fine and coarse aggregate.

      17) Outdoor temperature in the shade at the time at which the cement was added.

      18) Signature or initials of ready-mix representative.

2. Water from the truck water system or elsewhere shall not be added after the initial introduction of mixing water for the batch.

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 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.

B. Verify that forms are clean before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

E. In locations where new concrete is doweled to existing work, drill holes and epoxy dowels in existing concrete.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Unless otherwise indicated on the drawings, the details of fabrication shall conform to ACI 318.

B. Comply with requirements of ACI 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.

C. 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.

D. For all items subject to corrosion, including tie wires, provide the same concrete cover as is required for reinforcement under the same condition.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Concrete placed by pumping methods shall be done in accordance with ACI 304.2R.

D. Mixing Time: The time from initial introduction of mixing water to discharge shall not exceed the following computation: Time = 1 hour at concrete temperature of 75 degrees F +/- 15 minutes per 5 degree F drop/rise in concrete temperature. Examples follow:

   1. At concrete temperature of 50 degrees F, the time to discharge shall not exceed 2 hours and 15 minutes.
   2. At concrete temperature of 60 degrees F, the time to discharge shall not exceed 1 hours and 45 minutes.

3. At concrete temperature of 70 degrees F, the time to discharge shall not exceed 1 hours and 15 minutes.
4. At concrete temperature of 80 degrees F, the time to discharge shall not exceed 45 minutes.

E. Notify Engineer not less than 24 hours prior to commencement of placement operations.

F. Before concrete is placed, forms, reinforcement, waterstops, anchor bolts, and embedments shall be rigidly secured in proper position; all dirt, mud, water, and debris shall be removed from the space to be occupied by concrete; all surfaces encrusted with dried concrete from previous placements shall be cleaned.

G. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

H. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

A. Locate joints as indicated on the drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

D. Prior to concrete placement, the subgrade shall be well-dampened.

E. All exterior walls and interior floor slabs shall be in place and shall have obtained the design compressive strength prior to backfilling.

F. Conveying Concrete:
1. Methods of conveying concrete to the point of final deposit shall prevent segregation or loss of ingredients.
2. The free drop of concrete shall be limited to 5 feet.
3. Drop chutes shall be used for placement of concrete in walls. Drop chutes shall be positioned in walls 5 feet or less from wall corners and at 10 feet maximum centers.
4. After placement in the forms, concrete shall not be moved laterally more than 5 feet.

G. Consolidation/Compaction:
1. Consolidate in accordance with ACI 309R.
2. For proper consolidation/compaction, concrete shall be placed in approximately horizontal layers not to exceed 24 inches. Each layer of concrete shall be plastic when covered with the following layer, and the rate of vertical rise of the concrete in the forms shall be not less than 24 inches per hour.
3. During and immediately after placement, concrete shall be thoroughly compacted and worked around all reinforcement and embedments and into the corners of the forms.
4. The number and type of vibrators shall be acceptable to the Engineer.

5. When using internal vibrators, the "field of action" shall overlap. When placing concrete in lifts, the vibrator shall penetrate the previous lift by a few inches.
6. The use of "jitterbug" tampers to compact concrete flatwork will not be permitted.

H. Placement of Concrete on Slopes: Place, consolidate, and finish concrete from the bottom of the slope to the top of the slope.

I. Separate slabs on grade from vertical structure surfaces with joint filler.

J. Place joint filler in floor slab pattern placement sequence where indicated. Set top to required elevations. Secure to resist movement by wet concrete.

K. Install joint devices in accordance with manufacturer's instructions.

L. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

M. Place concrete continuously between predetermined expansion, control, and construction joints.

N. Do not interrupt successive placement; do not permit cold joints to occur.

O. Place floor slabs in checkerboard or saw cut pattern indicated.

P. Saw cut joints within 12 hours after placing. Unless noted otherwise, use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.

Q. Screed floors and slabs on grade to slope as indicated, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.06 Tolerances:

A. As specified in ACI 301 unless noted otherwise.

B. All concrete areas shall slope to drain. Water shall not be allowed to pond at any location.

3.07 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.
1. Tie holes in formed surfaces shall be cleaned, wetted, and filled with non-shrink grout.
2. The patches shall be finished flush and shall match the texture of the adjacent concrete.

B. Unexposed form finish including pit interiors: Rub down or chip off fins or other raised areas 1/8 inch or more in height.

C. Exposed form finish including, but not necessary limited to, walls, foundations & footings above grade, and retaining walls: Rub down or chip off and smooth all fins, offsets, or other raised areas 1/8 inch or more in height. Provide finish as follows:
1. Grout Cleaned Finish: Grout cleaned finish shall conform to Paragraph 5.3.3.4.b of ACI 301. Grout cleaning shall not result in an overall plastering of the concrete surface, but shall produce a smooth, uniform surface free of marks, voids, surface glaze, and cement dust.

a. Sandblast surface to expose air voids, sand aggregate, and to remove all form marking. Abrasive blast to scarify bare concrete to an ICRI CSP 5 surface profile and no more than an ICRI CSP 6 profile. Sandblast material shall be No. 4 Flint rock particles or "Black Beauty" or "Black Magic" (a boiler/coal slag).

b. Mix 1 part portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having the consistency of thick paint.

c. Wet the surface of the concrete sufficiently to prevent absorption of water from the grout and apply the grout uniformly with brushes or a spray gun.

d. Immediately after applying the grout, scrub the surface vigorously with a cork float or stone to coat the surface and fill all air bubbles and holes.

e. While the grout is still plastic, remove all excess grout by working the surface with a rubber float, burlap, or other means.

f. After the surface whitens from drying (about thirty minutes at normal temperatures), rub vigorously with clean burlap to provide a uniform sandy textured surface. For lazy river walls, the top 18 inches of the wall shall be rubbed sufficiently to provide a relatively smooth surface.

g. The finish shall be kept damp for at least 36 hours after final rubbing.

D. Finishing Unformed Surfaces:

1. General:

a. Buried concrete blocking and encasement will require no finishing except as necessary to obtain the required surface elevations or contours.

b. The unformed surfaces of all other concrete shall be screeded and given an initial float finish followed by additional floating, and troweling where required.

c. Water shall not be applied to the concrete during finishing operations.

2. Screeding: Screeding shall produce a concrete surface conforming to the proper elevation and contour, with all aggregates completely embedded in mortar.

3. Floating:

a. Bull Floating: Screeded surfaces shall be given an initial float finish immediately following screeding and shall be completed before any excess moisture or bleeding water is present on the surface. Any piece of coarse aggregate which is disturbed by the float or which causes a surface irregularity shall be removed and replaced with mortar. Initial floating shall produce a surface of uniform texture and appearance, with no unnecessary working of the surface.

b. Initial floating shall be followed by a second floating at the time of initial set (when foot pressure will mark concrete to about 1/4 inch depth). Do no floating with bleed water present. If conditions permit, wait out the bleeding period before floating. If not, remove bleed water before starting floating operations per ACI 302.1R. The second

floating shall produce a finish of uniform texture and color.

c. Floating shall be done with hand floats or suitable mechanical compactor-floats.

4. Finishing: Finish to requirements of ACI 302.1R, and as follows:

a. Surge Tanks or Wet Pits: Light broom finish. Brooming shall be done after the second floating.

b. Pump Pits: Broom finish to provide a uniform medium non-slip surface. Brooming shall be done after the second floating.

c. Concrete Decks and Walks: Broom finish to provide a uniform medium non-slip surface. Brooming shall be done after the second floating and at right angles to the normal direction of traffic.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains as indicated on drawings.

3.08 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

1. Normal concrete: Not less than 7 days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. 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 seven days by water ponding, water-saturated sand, water-fog spray, saturated burlap, or low permeability and high moisture retention non-staining natural cellulose fabric with non-perforated reflective (white) polyethylene coating.

2. Final Curing: Begin after initial curing but before surface is dry.

a. Moisture-Retaining Cover: Seal in place with waterproof tape or adhesive.

E. Concrete shall be protected against freezing for at least 8 days after placement.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. All concrete required for testing shall be furnished by, and at the expense of, the Contractor.

D. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of concrete operations.

E. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.

F. When concrete is pumped, sampling at both the truck discharge and point of final placement shall be required to determine if any changes in the slump, air content, and other significant mix characteristics occur. All concrete characteristics at the point of placement shall meet the specified requirements.

G. Compressive Strength Tests:

1. Compression test specimens shall be made, cured, stored, and delivered to the laboratory in accordance with ASTM C 31 and C 39.
2. One set of concrete test cylinders shall be cast for each concrete pour unless approved otherwise by Engineer. A set of test cylinders shall consist of four cylinders, two to be broken and to have compressive strengths averaged at 7 days, and two to be broken and to have compressive strengths averaged at 28 days.
3. One additional test cylinder shall be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.
4. Each set of compression test cylinders shall be marked or tagged with the date and time of day the cylinders were made, the location in the work where the concrete represented by the cylinders was placed, the number of the delivery truck or batch, the air content, the slump, and the concrete temperature.

H. Air Content:

1. Air content shall be determined in accordance with ASTM C 231.
2. An air content test shall be made on concrete from each batch of concrete from which concrete compression test cylinders are made.
3. The Contractor shall provide all equipment and supplies necessary for the testing.

I. Slump:

1. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.
2. Pumped Concrete:
   a. The slump of concrete that is discharged into the pump may exceed the specified value by the amount of slump loss in the pumping system, up to a maximum of 1 inch.
   b. The slump loss shall be determined by tests made at each end of the pumping system.
   c. If tests indicate a loss greater than 1 inch, Contractor shall modify the pumping system as required to reduce the slump loss to 1 inch or less.

J. Concrete Temperature:

1. A concrete temperature test shall be made on concrete from the first batch of concrete mixed each day and on concrete from each batch of concrete from which concrete compression test cylinders are made.
2. Concrete temperature shall be determined in accordance with ASTM C 1064.

3.10 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 not conforming to required lines, details, dimensions, tolerances or specified requirements.

C. In water retaining structures, crack widths that exceed ACI 224R requirements of 0.004 inches shall be treated with an appropriate injection system,which is acceptable to the Engineer.

D. 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.

E. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

END OF SPEC SECTION 131115

SECTION 13 11 67
ACCESS HATCHES FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Access hatches.

B. Ladder up safety post.

C. Fall protection grating system.

1.02 RELATED REQUIREMENTS

A. Section 33 49 10 - Manholes: Access hatch for manholes.

B. Section 03 30 05 - Pool Cast-in-Place Concrete: Opening in concrete.

C. Section 09 96 10 - Pool High-Performance Coatings: Access hatch coating.

1.03 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of all access door units.

D. Manufacturer's Installation Instructions: Indicate installation requirements.

1.04 PROJECT CONDITIONS

A. Coordinate the work with other work requiring access doors.

PART 2 PRODUCTS

2.01 ACCESS DOOR AND PANEL APPLICATIONS

2.02 ACCESS HATCHES

A. Single Leaf Non-Drainage Doors:

1. Manufacturers:

a. The Bilco Company; Type TER: Tel: (203) 934-6363; Fax: (203) 933-8478; www.bilco.com.

b. Halliday Products, Inc.; Series S1S: Tel: (800) 298-1027; Fax: (407) 298-4534; www.hallidayproducts.com.

c. Nystrom Building Products: Tel: (800) 547-2635 or (763) 488-9200; Fax: (800) 317-8770 or (763) 488-9201; www.nystrom.com.

d. U.S.F. Fabrication; Type APS: Tel: (800) 258-6873; Fax: (305) 882-1577; www.usffab.com.

2. Frame:

a. Material: 1/4 inch thick, one-piece extruded aluminum, incorporating a continuous concrete anchor.

b. Designed with 1-inch fillable pan for field installation of concrete fill or other material shown on drawings.

c. Finish: Mill finish.

d. Coating: A bituminous or epoxy coating shall be applied to the frame exterior where it will come in contact with concrete.

3. Panel Material: 1/4 inch aluminum diamond plate, reinforced to withstand a live load of 300 lbs per square foot.

4. Door shall open to 90 degrees and automatically lock with a stainless steel hold open arm with aluminum release handle.

a. The hold open arm shall incorporate an enclosed stainless steel compression spring assist.

b. Door shall close flush with the frame and rest on a built-in neoprene cushion/gasket.

5. Hardware: Hinges and all fastening hardware shall be stainless steel.

6. Unit shall lock with a stainless steel slam lock with removable key and have a non-corrosive handle.

7. All materials shall be aluminum or 304/316 S.S.

B. Ladder Up Safety Post:

1. Specified Manufacturer: The Bilco Company: Tel: (203) 934-6363; Fax: (203) 933-8478; www.bilco.com.

2. Acceptable Manufacturers:

a. Halliday Products, Inc.: Tel: (800) 298-1027; Fax: (407) 298-4534; www.hallidayproducts.com.

b. Nystrom Building Products: Tel: (800) 547-2635 or (763) 488-9200; Fax: (800) 317-8770 or (763) 488-9201; www.nystrom.com.

c. U.S.F. Fabrication: Tel: (800) 258-6873; Fax: (305) 882-1577; www.usffab.com.

3. Ladder up safety post shall have the following:

a. Pull up loop.

b. Release rod with vinyl lift handle.

c. Lock up bracket.

d. Balancing spring.

e. Square tubing.

f. Adjustable mounting channel.

g. Clamp bracket.

h. Stainless steel mounting bolts.

4. The ladder post shall be furnished completely assembled ready to mount on rear of ladder with clamp brackets on climbing side.
5. Material/Finish: Stainless steel.

C. Fall Protection Grating System:
1. Specified Manufacturer: The Bilco Company: Tel: (203) 934-6363; Fax: (203) 933-8478; www.bilco.com.
2. Acceptable Manufacturers:
   a. Halliday Products, Inc.: Tel: (800) 298-1027; Fax: (407) 298-4534; www.hallidayproducts.com.
   b. Nystrom Building Products: Tel: (800) 547-2635 or (763) 488-9200; Fax: (800) 317-8770 or (763) 488-9201; www.nystrom.com.
   c. U.S.F. Fabrication: Tel: (800) 258-6873; Fax: (305) 882-1577; www.usffab.com.
3. Door manufacturer shall install the grating system when the door is fabricated or field install (by others) on existing doors already in use. If field installation is necessary, grating system shall be installed per the manufacturer's instructions.
4. Performance Characteristics:
   a. Grating panels shall be high visibility safety yellow in color.
   b. Grating panels shall lock automatically in the full open position.
   c. Grating system shall have a twenty-five year warranty.
   d. Grating panels shall have a provision for locking to prevent unauthorized opening.
5. Grating: Panels shall be aluminum with a powder coat paint finish and designed to meet OSHA 29 CFR 1926.502(c) requirements for fall protection.
6. Hold open feature: A Type 316 stainless hold open device shall be provided to lock the cover in the fully open 90 degree position.
7. Hardware: All hardware shall be Type 316 stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. All units shall be cast-in-place unless approved otherwise by Engineer.
B. Install units in accordance with manufacturer's instructions.
C. Install frames plumb and level in openings. Secure rigidly in place.
D. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION

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SECTION 13 11 70
PVC FABRICATIONS FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Spray ground trench drain gutter

1.02 RELATED SECTIONS

1.03 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Manufacturer's Information: Published literature including material data, corrosion resistance data, and concrete anchor systems.

C. Shop Drawings: Indicate material sizes, types, styles, color, part or catalog numbers, complete details for the fabrication of and erection of components including, but not limited to, location, lengths, type and sizes of fasteners, clip angles, member sizes, and connection details.

D. Samples: Submit sample pieces of each item specified herein for acceptance by the Engineer as to quality and color. Sample pieces shall be manufactured by the method to be used in the Work.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Delivery of Materials: Manufactured materials shall be delivered in original, unbroken pallets, packages, containers, or bundles bearing the label of the manufacturer.

B. Storage of Products: All materials shall be carefully handled to prevent them from abrasion, cracking, chipping, twisting, other deformations, and other types of damage. Store items in an enclosed area and free from contact with soil and water.

PART 2 PRODUCTS

2.01 SPRAY GROUND GUTTER GRATING - PARALLEL DESIGN

A. Specified Manufacturer: Daldorado, LLC; Tel: (888) 509-8128; www.daldorado.com.

B. Acceptable Manufacturer: Lawson Aquatics; Tel: (800) 897-6160; www.lawsonaquatics.com.

C. Model: CapSHURE Drain System. Drain provided up to 8-ft. lengths, 4-in. wide andin either 2-in. or 4-in. depths. The deck drain is rigid PVC and has an 8-in. wide flatbase with system to enable it to be stabilized and leveled prior to concrete placementSee drawings for specific dimensions for this application.

D. Grate: Grate is formed of molded PVC modular interlocking sections certified withNSF/ANSI 50, UV stabilized. The grate surface bars run parallel with the deck drainand provides 40% open

area for unrestricted water flow.

E. Accessories: Provide with accessories and components necessary- including drop outboxes,end caps,bottom outlets, comers, and tees.

F. Entrapment: Grate openings do not exceed 0.315-in.(8mm) and complies with IBCF.child finger and toe entrapment guidelines.

G. Warranty:Grates carry a 10-Year manufacturer's warranty.

H. Color: To be selected by Owner from manufacturer's standard colors of white, bone.and gray.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that Work is ready to receive grating.

3.02 INSTALLATION

A. Install gratings in accordance with manufacturer's instructions.

B. Field cutting or modifications to grating shall not be permitted without Engineer's prior approval.

END OF SECTION

SECTION 13 11 85
EQUIPMENT FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pumps.

B. Fiberglass pressure sand filters.

C. Chemical feeders.

D. Ultraviolet light (Alternate No. 1)

E. Flow measuring devices.

F. Electronic water level sensor.

G. Float Switch

1.02 RELATED SECTIONS

A. Section 13 11 90 - Piping and Valves For Spray Grounds

1.03 REFERENCES

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Pumps and Motors: The data and specifications for each unit shall include, but shall not be limited to, the following:

1. Pumps:
   a. Name of manufacturer.
   b. Type and model.
   c. Rotative speed.
   d. Size of suction nozzle.
   e. Size of discharge nozzle.
   f. Net weight of pump.
   g. Complete performance curves showing capacity versus head, NPSH required, pump efficiency, and BHP.
2. Motors:
   a. Name of manufacturer.
   b. Type and model.
   c. Type of bearing and lubrication.
   d. Rated size of motor, HP.
   e. Temperature rating.
   f. Full load rotative speed.
   g. Net weight.

h. Efficiency at full, 3/4, and 1/2 load.

i. Full load current.

j. Locked rotor current.

C. Product Data: Manufacturer's catalog data, detail sheets, and specifications.

D. Shop Drawings: Prepared specifically for this project; show dimensions of equipment and interface with other products.

E. Manufacturer's Instructions: Indicate installation methods and procedures.

F. Operating and Maintenance Data: Operating and maintenance instructions, parts lists, and wiring diagrams.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform in accordance with applicable codes and health department regulations , as required for location of project.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 10 years of documented experience.

C. Supplier's Field Representative: Individual specializing in the start-up and training of the equipment specified in this section, with not less than 5 years experience.

D. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

E. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Deliver materials and equipment to project site in manufacturer's original packaging..

B. Store all materials and equipment under cover and elevated above grade or as instructed by manufacturer.

PART 2 PRODUCTS

2.01 SUPPLIERS

A. Swimming Pool Supply Company, 5292 N.W. 111th Street Drive, Grimes, Iowa 50111. Tel: (515) 986-3931; Fax: (515) 986-3805.

B. United Industries, Inc., 202 E. Cleveland, PO Box 58, Sterling, Kansas 67579. Tel: (800) 835 3272; Fax: (800) 500-3115; www.swimtime.com.

C. Spectrum Pool Products, 7100 Spectrum Lane, Missoula, Montana 59808. Tel: (800) 776-5309; Fax: (800) 728-7143; www.spectrumproducts.com.

D. Recreation Supply Company, P.O. Box 2757, Bismarck, ND 58502. Tel: (800) 437-8072; Fax: (701) 255-7895; www.recsupply.com.

2.02 END SUCTION CENTRIFUGAL PUMPS (SMALL PUMPS)

A. Specified Manufacturer: Speck Pumps, Jacksonville, FL, Tel: (800) 223-8538 www.Speck-Pumps.com

B. Specified Manufacturer: Pentair Pools, Integral strainer pump: Tel: (800) 831-7133, www.pentairpool.com

C. Acceptable manufacturers:
   1. Hayward: www.Hayward.com

D. Pump Schedule:
   1. Recirc pump:
      a. Pentair Model WhisperFlo XFK - 8
   2. Features pump:
      a. Zone 1: Speck Model BADU Pro E
      b. Zone 2: Speck Model BADU Pro E
      c. Zone 3: Speck Model BADU Pro E
      d. Zone 4: Speck Model 95-IX

E. Pumps shall be high performance end suction pump meeting the following:
   1. Housing: Thermoplastic
   2. Shaft: Stainless Steel
   3. Performance Criteria: As indicated on the drawings
   4. Pumps shall be NSF-50 certified

F. Motor:
   1. Size and Speed: As indicated on drawings
   2. Voltage/Phase: As indicated on the drawings.
   3. VFD: As indicated on the drawings.

G. General:
   1. Self-priming
   2. Pump shall be able to be connected to water feature controller.
   3. IntelliFlo and IntelliPro pumps shall be provided with Intellicom system when required to be connected to remote Start-Stop-Timers.

2.03 SUMP PUMP

A. Specified manufacturers: Grainger Stock No. 3YU59.

B. Acceptable manufacturers:
   1. Zoeller: www.ZoellerPumps.com
   2. Goulds: www.GouldsPumps.com

C. Specifications:

1. Submersible plastic sump pump.
2. HP Rating: 1/2.
3. Voltage: 115.
4. Automatic switch with off point 1.38 inches and on point at 5.9 inches.
5. Water flow at 5 feet of head: 41 gpm.
6. Shut-Off: 35 feet.
7. Discharge NPT: 1-1/4 inches.
8. Maximum Solid Handling: 1/8 inch.
9. Maximum Temperature: 77 degrees F.
10. Cord: 18/3 x 10 feet.

2.04 FIBERGLASS PRESSURE SAND FILTERS

A. Specified Manufacturer: Pentair; Model Triton II; www.pentair.com.

B. Acceptable Manufacturers:
   1. Waterco; Model SM; www.waterco.us
   2. Hayward: www.Hayward.com

C. Construction: Durable, non-corrosive filter with 3" connections.

D. Certifications: Filter shall be tested and certified by a nationally recognized testing laboratory to conform to NSF Standard 50.

E. Provide Multiport valve.

F. Filter Area: Per the drawings.

G. Sand/Gravel Media:
   1. Quantity: Sand and gravel per manufacturer to meet NSF Standard 50.
   2. Filter Sand:
      a. No. #20 white quartz silica sand.
      b. Size Range: 0.40 to 0.55 mm.

2.05 CHEMICAL FEEDERS - PERISTALTIC TYPE

A. Manufacturers:
   1. Specified Manufacturer: Stenner & Company, Inc.; Tel: (800) 683-2378 or (904) 641-1666; Fax: (904) 642-1012; www.stenner.com.
   2. Acceptable Manufacturers:
      a. Blue-White[<>]; Tel: (714) 893-8529; Fax: (714) 894-9492; www.bluwhite.com
      b. LMI: www.LMIPumps.com

B. General: Chemical feed pumps shall be peristaltic type pumps that are UL approved.

C. Voltage: 120 VAC, US Plug.

D. Accessories:

1. Corrosion resistant mounting hardware and accessories including corrosion resistant mounting bracket and rain roof.
2. Provide complete suction assembly including lead tubing, connecting nut, ferrule, and clay weight.
3. Provide complete discharge assembly including lead tubing, connecting nuts, and injection fitting.
4. Provide five (5) tube assemblies with ends.

E. Schedule:
1. Spray ground -Muriatic Acid Feeder: Model 45M5; 50.0 gpd; 25 psi.
2. Spray ground -Sodium Hypochlorite Feeder: Model 45M1; 3.0 gpd; 25 psi.

2.06 ULTRAVIOLET LIGHT (LOW PRESSURE, HIGH OUTPUT)

A. Specified Manufacturer: Sentry Ultraviolet, Inc.; Model SAG 240-A-PVC-CR; Tel: (866) 226-0820 or (706) 379-2670; Fax: (706) 379-1428; www.sentryuv.com.

B. Acceptable manufacturers:
1. Pentair BioShield Pro
2. Delta UV, Evoqua

C. Lamps:
1. Type: Low pressure, high output (amalgam).
2. Maximum Lamp Power: 120 watts.
3. Number of Lamps: 2.
4. Lamp Life: 13,000 hours.

D. UV Dose (to be verified per Local Code and mftr.):
1. Spray Grounds
   a. Design dose: 60 mJ/cm2
   b. End of lamp life dose: 45 mJ/cm2

E. Chamber:
1. Provide quick disconnects at each sleeve.
2. Maximum Operating Pressure: 50 psi.
3. Connection: Stainless steel flanges.
4. Chamber Material: Sch 80 PVC with 316L stainless steel interior.
5. Provide a drain plug that allows draining the unit for winterization.
6. Provide with a safety cover that when removed turns all lamps off before they can be removed.

F. Control Panel:
1. Power: 120 or 240 volt, as indicated on the electrical drawings.
2. Safety Features:

a. Terminally protected automatically shuts down if abnormal operating temperature are reached.
b. A pressure switch shall shut the system off if the water flow stops.
c. Sensor monitors fowling and loss of 254nm sterilizing wave length. LED lights on control alerts of this condition.
d. Sensor detect lamp outage. Glow fitting on top of lamp will alert of lamp outage.

3. Switch: Lighted on/off switch showing whether power is on or off.

G. Strainer: Provide a strainer for installation downstream of unit to capture broken glass.

2.07 SECONDARY CONTAINMENT PALLET AND RAMP

A. Pallet:
1. Description: Low profile drum spill containment pallet constructed of low-density polyethylene for excellent durability and chemical resistance. Features textured grating which removes easily for cleaning. Translucent sidewalls allow easy visual inspection.
2. Capacity: 22 gallons.
3. Load Capacity: 3,000 lbs.
4. Dimensions: 26" W x 52" L x 5.75" H.

B. Ramp:
1. Load Capacity: 600 lbs.
2. Dimensions: 33.5" W x 24" L x 5.75" H.
3. Composition: Polyethylene.

2.08 FLOW MEASURING DEVICES

A. Indicator Arm Flowmeter:
1. Specified Manufacturer: H2flow Controls, Inc.; Model FlowVis Flowmeter; www.h2flow.net.
2. Acceptable manufacturers:
a. Blue-White Industries: www.Blue-White.com
b. Signet: www.gfps.com
3. Features:
a. Direct reading in gallons per minute (gpm).
b. NSF 50 Approved.

2.09 ELECTRONIC WATER LEVEL SENSOR

A. Specified Manufacturer: Levolor by System Dynamics; Model K-1100: Tel: (800) 844-8514; www.levolorproducts.com.

B. Specified Manufacturer: Pentair Intellilevel water level system, Tel: (800) 831-7133, www.pentairpool.com

C. The system shall be complete with the following:

1. Sensor with wire and remote sensor housing.
2. Control box.
3. 24 VAC solenoid valve.

D. The system shall be solid state, with non-corrosive components, NEMA 4 enclosure and all components suitable for use in a mechanical room environment.

2.10 FLOAT SWITCH

A. Specified Manufacturer: Madison Co.; Model M4189-XXXX; www.madisonco.com.
1. Contact Rating: 16A/250VAC/60Hz; General Purpose, 1/2HP/240VAC/60Hz; Form C (SPDT)
2. Max. Submerged Depth: 20 Meters.
3. Max. Working Pressure: 14.5 PSIG.
4. Operational SG: 0.9 to 1.3.
5. Cable Material: PVC Jacketed Cable.
6. Float Material: Polypropylene.
7. Max. Temperature: 70 degrees C.
8. Cable Leads: 2 Meters, 18 AWG, 3 Conductor, PVC Jacketed.
9. General: Float switch for low water cut-off for pool pumps.

PART 3 EXECUTION

3.01 EXAMINATION

A. Coordinate with other trades for proper installation of plumbing and electrical services.

B. Verify that required utilities are in correct location and are of correct capacities for specified products.

C. Verify equipment rough-in before proceeding with work.

3.02 INSTALLATION

A. Install equipment specified in this section in accordance with manufacturer's printed installation instructions; comply with standards required by authorities having jurisdiction.

B. Schedule installation to ensure that utility connections are achieved in an orderly and expeditious manner.

C. Install equipment plumb, level, square, and straight, without distortion; securely anchor.

3.03 STARTING EQUIPMENT AND SYSTEMS

A. Adjust for proper operation within manufacturer's published tolerances.

B. Provide supplier's field representative to prepare, start, adjust, and demonstrate proper operation of equipment to Owner's designated staff.

3.04 CLEANING

A. Touch up minor damaged surfaces caused by installation.

B. Replace damaged components as directed by Engineer.

C. Clean all equipment.

D. Protect installed equipment from subsequent construction operations.

END OF SPEC SECTION 131185

SECTION 13 11 87
CHEMICAL CONTROLLER FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. A programmable chemical automation system for continuous monitoring and control of pH and disinfectant.

1.02 RELATED SECTIONS

A. Section 13 11 85 - Equipment for spray grounds

1.03 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's descriptive literature for specified systems, including all components.

C. Shop Drawings: Indicate component connection details and details of interface with adjacent construction.

D. Manufacturer's Instructions: Indicate installation instructions for specified equipment, including each component.

E. Operation and Maintenance Data: The manufacturer shall supply a complete instruction, operating and maintenance manual.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

C. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Delivery: Deliver materials to site in manufacturer's original, unopened packaging.

B. Storage: Store all equipment and materials under cover and elevated above grade.

C. Protection: Protect equipment and materials to prevent damage.

1.06 WARRANTY

A. The controller shall be covered by a standard manufacturer warranty of five (5) years.

B. All sensors will be covered by a standard one (1) year warranty.

C. Other parts shall be covered by their own manufacturer's warranty.

D. The controller shall not require a service technician for annual calibration, seasonal start up, or whenever chemicals supplier or type are changed.

PART 2 PRODUCTS

2.01 CONTROLLER

A. Manufacturers:

1. Specified Manufacturer: Santa Barbara Control Systems; Model Chemtrol PC2100 Programmable Controller: 5375 Overpass Road, Santa Barbara, CA 93111; Tel: (800) 621-2279; Fax: (805) 683-1893; www.sbcontrol.com.
2. Acceptable manufacturers:
   a. BECS
   b. ProMinent

B. The controller shall automatically activate the appropriate chemical feeders in order to maintain the sanitizer activity level within +/- 10 mV (millivolts) of ORP and the pH within +/- 0.1 pH unit of the setpoints selected by the operator. All setpoint and calibration levels shall be adjustable with a numeric keypad mounted on the front panel of the unit. Controllers with internal switches or calibration adjustments and/or requiring special signal generating equipment to service will not be considered equal.

C. The controller shall include programmable daily and weekly cycles for shocking (superchlorination) and chemical saving level.

D. The controller shall continuously display the Langelier Saturation Index using either sensor data and/or manual input for pH, temperature, total alkalinity and calcium hardness. The resulting calculated water condition shall be displayed on the main screen as either "Scaling", "Corrosive" or "OK".

E. The controller shall be contained in a NEMA Type 3 (rain and splash proof) lockable fiberglass cabinet with an LCD graphic display screen of four (4) lines of twenty (20) alphanumeric characters each. The main display screen shall show the current values, control mode and operational status for ORP, pH and temperature. Controllers with smaller displays or displays that require scrolling through menus will not be considered equal. All screens shall have the capability of being displayed at any time at the option of the operator in unabbreviated English, French or Spanish and in US or metric units.

F. The controller shall be factory set to water treatment industry standards. The operator shall be able at any time to adjust all programmable functions to preferred settings. The controller shall have a reset mode to reset all or selected functions to the original factory standards.

G. The controller shall have the capability to calibrate all sensor inputs, depending on the accuracy needed, using either 1, 2, or 3-point calibration to determine respectively the origin, slope and curvature of the calibration curve.

H. The controller shall be capable of operating each output in the following operator-selectable modes of operation: automatic, manual, timer or off. In the automatic mode, the operator shall be able to choose between on/off control and proportional feed control based on deviation from setpoint.

I. The controller shall include programmable high and low alarm levels for all control functions with operator selectable feed lockout and alarm buzzer options.

J. The controller shall continuously monitor and alert for probe failure using dynamic probe testing before the water chemistry gets out of range. Failure alarms based only on safety timers and/or out-of-range conditions will not be considered equal.

K. The controller shall record and display the elapsed run time for each activation event and a cumulative run time resettable at any time by the operator. The controller shall provide for operator-adjustable run time limits for all control functions.

L. The controller shall include a battery for memory storage with minimum reserve power for six (6) months of power shutdown.

M. The controller shall have an on-board memory for storing of test data on operator-selectable schedules. An RS-232 serial communications port shall be included for on-site downloading of test data.

N. Options to be provided:

1. ETHCOM: The controller shall include an Ethernet/Internet modem for remote operation by PC-compatible computer using Ethernet/Internet network communications. A Windows-based software program shall be supplied with true duplex operation capability representing the actual controller screen display with automatic downloading and visual graphics representation of test data.
2. Water Temperature: The controller shall monitor and display the water temperature in degrees Fahrenheit or Celsius with adjustable high and low alarms.
3. BPL: A bypass line for installation of the sensors shall be provided with a safety flow switch and a sampling valve for water testing. An in-line filter and flowmeter shall be provided as required by mftr.
4. SCA: The sensors shall be mounted in a see-through flow cell with a clear cover located inside a lockable fiberglass enclosure with a window.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install all equipment in accordance with shop drawings and manufacturer's printed installation instructions; comply with standards required by authorities having jurisdiction.

C. Schedule installation to ensure that utility connections are achieved in an orderly and expeditious manner.

D. Install equipment plumb, square, and straight, without distortion; securely anchor.

3.02 INTERFACE WITH OTHER WORK

A. Coordinate with other trades for proper installation of plumbing.

3.03 STARTING EQUIPMENT AND SYSTEMS

A. Adjust for proper operation within manufacturer's published tolerances.

B. Provide manufacturer's field representative to check-out installation, provide start up, and instruct operating personnel on proper operation and maintenance of equipment.

3.04 ADJUSTING AND CLEANING

A. Adjust equipment, including water requirements, for smooth operation.

B. Touch up minor damaged surfaces caused by installation.

C. Replace damaged components as directed by Engineer.

3.05 CLEANING and PROTECTION

A. Clean all pieces of equipment.

B. Protect installed equipment from subsequent construction operations.

END OF SPEC SECTION 131187

SECTION 13 11 90
PIPING AND VALVES FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, valves, and connections for piping systems.

B. Polyvinyl chloride (PVC) pipe.

C. Saddles.

D. Valve keys.

E. Valve extension stems and stem guides.

F. Valve boxes.

G. Valves.

H. Strainers.

I. Pressure gauges.

J. Compound pressure gauges.

1.02 RELATED REQUIREMENTS

A. Section 13 11 94 - Mechanical Identification for spray grounds

1.03 REFERENCE STANDARDS

A. ASME B16.5 - Pipe Flanges and Flanged Fittings; 1996.

B. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers; 2011 (ANSI/ASME B31.9).

C. ASME (BPV IX) - Boiler and Pressure Vessel Code, Section IX - Welding and Brazing Qualifications; The American Society of Mechanical Engineers; 2010.

D. ASTM D 1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 1999a.

E. ASTM D 2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80; 1999.

F. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings; 1996 (Reapproved 2010).

G. ASTM F 656 - Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings; 1996a.

H. ASTM F 593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2001.

I. ASTM F 594 - Standard Specification for Stainless Steel Nuts; 2001.

J. AWWA C651 - Disinfecting Water Mains; American Water Works Association; 2005 (ANSI/AWWA C651).

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data/ Submittals:

1. Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
2. For PVC piping, provide manufacturer's recommended installation procedures, including solvent weld jointing procedures.

C. Project Record Documents: Record actual locations of piping and valves.

D. Training and certification documentation as indicated below.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes.

B. Training and Certification: PVC Pipe Installer.

1. PVC piping installers must be trained by manufacturer to install and join piping. Submit written certification from manufacturer for each individual performing pipe installation, prior to installing pipe.

C. Valves: Manufacturer's name and pressure rating marked on valve body.

D. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations.

E. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.06 REGULATORY REQUIREMENTS

A. Perform Work in accordance with local plumbing code.

B. Conform to applicable code for installation of backflow prevention devices.

C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.08 FIELD CONDITIONS

A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PIPE

A. PVC Pipe, Schedule 80:
   1. Pipe: ASTM D 1785, Cell Classification 12454-B, bearing NSF seal.
   2. Fittings: ASTM D 2467, Cell Classification 12454-B, bearing NSF seal.
      a. All fittings for pipe diameters less than 16" shall be molded. Fabricated fittings will not be allowed unless approved by Engineer. Contractor shall be responsible for verifying that the use of fabricated fittings will not affect critical dimensional requirements.
      b. For pipe diameters of 16" or greater: Fabricated fitting are allowed.
   3. Push-on Joints: ASTM F 477 elastomeric gaskets.
   4. Solvent Weld Joints:
      a. Solvent Cement: ASTM D 2564.
      b. Primer: ASTM F 656.
   5. Flanges: Diameter and drilling shall conform to ANSI/ASME B16.5, Class 150.
   6. Flange Hardware:
      a. Bolts: Stainless steel, ASTM F 593, Alloy Group 1 or 2; chamfered or rounded ends projecting 1/8 to 3/8 inch beyond outer face of nut.
      b. Nuts: Stainless steel, ASTM F 594, Alloy Group 1 or 2.
      c. Flat Washers: Stainless steel, ANSI B18.22.1.
   7. Flange Gaskets: Full face, 1/8 inch thick, chemical resistant elastomeric material suitable for the specified service.

B. PVC Pipe, Schedule 40:
   1. Pipe: ASTM D 1785, Cell Classification 12454-B, bearing NSF seal.
   2. Fittings: ASTM D 2466, PVC. All fittings for pipe diameters of less than 16" shall be molded. Fabricated fittings will not be allowed unless approved by Engineer. Contractor shall be responsible for verifying that the use of fabricated fittings will not affect critical dimensional requirements. For pipe diameters of 16" or greater: Fabricated fitting are allowed.
   3. Push-on Joints: ASTM F 477 elastomeric gaskets.
   4. Solvent Weld Joints:
      a. Solvent Cement: ASTM D 2564.
      b. Primer: ASTM F 656.

C. PVC Pressure-Rated Pipe, SDR 21:
   1. Pipe: ASTM D 2241 SDR 21 for 200 psi rating.
   2. Fittings: ASTM D 2466, PVC.

3. Joints: ASTM D 2855, solvent weld.

2.02 ADAPTER FLANGE FOR PVC PIPE

A. Van Stone Style:
   1. Two-piece design with rotating flange ring in socket or spigot configuration.
   2. Conformance Standards:
      a. Socket and Spigot: ASTM D 2467.
      b. Bolt Hole Pattern: ASME B16.5.
      c. Material: ASTM D 1784; PVC Cell Classification 12454-B.

2.03 SPECIAL REINFORCED FITTINGS

A. All threaded plastic connections and threaded plastic-to-metal transition connections shall be made with Spears Special Reinforced (SR) Fittings.
B. All fittings shall be Schedule 80 PVC, conforming to ASTM D 2467.
C. All fittings shall be approved for potable water service.

2.04 FLANGES, UNIONS, AND COUPLINGS

A. A union or a flanged connection shall be provided within 2 feet of each threaded end valve unless the valve can be easily removed from the piping.
B. Unions for Pipe Sizes 3 Inches and Under:
   1. Copper tube and pipe: Class 150 bronze unions with soldered joints.
C. Flanges for Pipe Size Over 1 Inch:
   1. Copper tube and pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
D. Dielectric Fittings:
   1. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
   2. Insulating Material: Suitable for system fluid, pressure, and temperature.
   3. Dielectric Unions:
      a. Manufacturers:
         1) Capitol Manufacturing Co.
         2) Central Plastics Company.
         3) Eclipse, Inc.
         4) Epco Sales, Inc.
         5) Hart Industries, International, Inc.
         6) Watts Industries, Inc.; Water Products Div.
         7) Zurn Industries, Inc.; Wilkins Div.

b. Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 degrees F.

4. Dielectric Flanges:
   a. Manufacturers:
      1) Capitol Manufacturing Co.
      2) Central Plastics Company.
      3) Epco Sales, Inc.
      4) Watts Industries, Inc.; Water Products Div.
   b. Factory-fabricated, companion-flange assembly, for 150-psig minimum working pressure as required to suit system pressures.
5. Dielectric-Flange Kits:
   a. Manufacturers:
      1) Advance Products & Systems, Inc.
      2) Calpico, Inc.
      3) Central Plastics Company.
      4) Pipeline Seal and Insulator, Inc.
   b. Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
   c. Separate companion flanges and steel bolts and nuts shall have 150-psig minimum working pressure where required to suit system pressures.
6. Dielectric Couplings:
   a. Manufacturers:
      1) Calpico, Inc.
      2) Lochinvar Corp.
   b. Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 degrees F.
7. Dielectric Nipples:
   a. Manufacturers:
      1) Perfection Corp.
      2) Precision Plumbing Products, Inc.
      3) Sioux Chief Manufacturing Co., Inc.
      4) Victaulic Co. of America.

b. Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 degrees F.

2.05 PVC SADDLES

A. All plastic saddle fittings shall be clamp-on type with O-ring seal constructed from PVC Schedule 80.

B. All O-rings shall be EPDM.

C. All saddles shall be piloted at O-ring area for positive positioning in pipe.

D. All bolt clamping hardware shall be stainless steel.

E. All threaded saddle outlets shall be Steel Reinforced (SR) design.

F. Saddles shall have a maximum internal pressure rating of 235 psi for pipe sizes through 4 inch, 200 psi for 6 inch pipe, and 150 psi for 8 through 12 inch pipe at 73 degrees F.

2.06 VALVE KEY

A. Material: Rolled steel.

B. The valve key shall be made up of an extension rod, a wrench nut at the bottom, and at the top a "T" handle.

C. The wrench nut shall fit over the 2 inch square nut of the valve stem being raised.

D. Length: The length of the valve key shall be as required to operate the valve(s) at a height of 3 feet above grade (operating level).

2.07 VALVE EXTENSION STEMS AND STEM GUIDES

A. Manufacturers:

1. Specified Manufacturer: Trumbull Industries, Inc.; Tel: (800) 677-1799; www.trumbull.com.
2. Acceptable Manufacturers:
   a. M & H; Tel: (256) 237-3521; www.mh-valve.com.
   b. Clow; Tel: (800) 829-2569; www.clowvalve.com.
   c. Waterman Industries, Inc.; Tel: (800) 331-0808; www.watermanusa.com.

B. Extension Stems:

1. Material: Type 304 stainless steel.
2. The extension stem shall be made up of an extension rod, a wrench nut coupling at the bottom, and at the top a 2 inch square wrench nut or handwheel as indicated on the drawings.
3. The wrench nut coupling shall fit over the 2 inch square nut of the valve stem being raised and shall be held to the nut by a set screw threaded in the wrench nut coupling.
4. The wrench nut or handwheel and wrench nut coupling shall be pinned to the extension rod which is drilled to receive steel pins.

5. The wrench nut and wrench nut couplings shall be stainless steel, Type 316.

C. Stem Guides:

1. Stem guides shall be installed as wall brackets to support extension stems.
2. Valve stem guides shall be fully adjustable and made of Type 316 stainless steel.
3. The guide shall be bronze bushed where the extension stem passes through.

2.08 VALVE BOXES - PLASTIC

A. Specified Manufacturer: Rainbird; www.rainbird.com.

B. Acceptable manufacturers:

1. Hubbell: www.Hubbell.com
2. NDS: www.NDSPro.com

C. Rugged, UV-resistant thermoplastic construction.

D. Slotted body to facilitate installation of piping.

E. Light traffic rated

2.09 PVC BALL VALVES

A. Manufacturers:

1. Spears Manufacturing Company: www.spearsmfg.com.
2. Nibco, Inc; Model U-45TB: www.nibco.com.
3. Hayward Industries, Inc.: www.haywardflowcontrol.com.

B. Construction:

1. True Union type constructed from PVC Type I Cell Classification 12454 conforming to ASTM D 1784.
2. O-rings shall be EPDM.
3. All valves shall have Safe-T-Shear stem and double stop polypropylene handle.
4. All valve union nuts shall have Buttress threads.
5. All valve seal carriers shall be Certified for potable water use by NSF International.
6. All 1/2 inch through 2 inch valves shall be pressure rated at 235 psi and all 2-1/2 inch through 6 inch valves shall be pressure rated at 150 psi for water at 73 degrees F.

2.10 PVC BUTTERFLY VALVES

A. Manufacturers:

1. Specified Manufacturer: Spears Manufacturing Company; Style Wafer or Lug: www.spearsmfg.com.
2. Acceptable Manufacturers:
   a. ASAHI/AMERICA: www.asahi-america.com.
   b. Hayward Industries, Inc.: www.haywardflowcontrol.com.
   c. Nibco, Inc: www.nibco.com.

B. Construction:

1. Valve body and disc shall be constructed from PVC Type I Cell Classification 12454 conforming to ASTM D 1784.
2. Valve seats and O-rings shall be EPDM. Seat shall be a non-liner type interlocked to valve body.
3. Lug Style: Bolt hole patterns shall conform to ANSI/ASME B16.5 CL 150.
4. Wafer Style: Designed for mounting between two flanges having bolt hole pattern that conform to ANSI/ASME B16.5 CL 150.
5. Disc shall be offset design with Type 316 stainless steel stem.
6. Lever operated valves shall be equipped with high impact polypropylene handle having built-in lockout capability.
7. Gear operated valves shall be equipped with position indicator and high impact polypropylene handwheel.
8. All submerged valves shall have submersible gear operators.
9. Valves shall be pressure rated at 150 psi for water at 73 degrees F.

2.11 BRASS SOLENOID VALVES

A. 3/4 to 2 Inch:

1. Specified Manufacturer: Granzow; Model 21W; www.granzow.com.
2. Acceptable manufacturer:
   a. ASCO: www.AscoValve.com
   b. US Solid: www.USSolid.com
3. Description: Two-way, internally piloted, normally closed or normally open (as indicated on the drawings), solenoid valve.
4. Sealing Material: FKM (Viton).
5. Pipe Size: As indicated on the drawings.
6. Materials of Construction:
   a. Body: Brass.
   b. Armature Tube: Stainless Steel 300.
   c. Fixed Core: Stainless Steel 400.
   d. Plunger: Stainless Steel 400.
   e. Spring: Stainless Steel 300.
   f. Shading Ring: Copper.
   g. Orifice: Brass.
7. Provide with nickel plated finish.
8. Coil Specifications:
   a. BDU Molding Material: PET - Black polyester - Class F (312 degrees F).

b. Power/Voltage: 8 watt/110-120 volt or 8 watt/24 volt as indicated on the drawings.

9. Electrical Connection:

a. Rating: NEMA 4.

b. Provide with 1/2" conduit connector.

2.12 PVC BALL CHECK VALVES

A. Application: For use on PVC piping systems where called for on the drawings; sizes 6" and smaller.

B. Construction:

1. Constructed from PVC Type I Cell Classification 12454 conforming to ASTM D 1784.
2. Industrial grade.
3. All valve seals shall be standard O-ring type EPDM.
4. Fully serviceable with replaceable components.
5. Sizes 1/2 inch to 2 inch shall be pressure rated to 235 psi, sizes 2-1/2 inches to 6 inches and all flanged shall be pressure rated to 150 psi for water at 73 degrees F.
6. NSF certified for potable water use.

2.13 PVC INDUSTRIAL SWING CHECK VALVES

A. Application: For use on PVC piping systems; sizes 8" and smaller.

B. Construction:

1. Flanged swing check type constructed from PVC Type I Cell Classification 12454 conforming to ASTM D 1784.
2. All valve seals shall be standard O-ring type EPDM.
3. All valve components shall be replaceable.
4. All valves shall have O-ring sealed drain plug.
5. All valves shall have external counter balance.
6. All 3/4 inch to 4 inch valves shall be pressure rated at 150 psi, all 6 inch valves at 100 psi, and all 8 inch valves at 70 psi for water at 73 degrees F.

2.14 AIR RELEASE VALVES

A. Specified Manufacturer: A.R.I. USA, Inc.; Model S-050 V: Tel: (559) 269-9653; www.ariusa.com.

B. Acceptablemanufacturers:

1. Flomatic: www.Flomatic.com
2. Val-Matic: www.Valmatic.com

C. Materials of Construction:

1. Body: Reinforced Nylon.
2. Discharge Outlet: Polypropylene.

3. Rolling Seal: EPDM.
4. Clamping Stem: Reinforced Nylon.
5. Float: Foamed Polypropylene.
6. O-Ring: NBR 70.
7. Base: Reinforced Nylon.

D. Size: As noted on Drawings.

E. For air release only valves provide with vacuum guard to allow air discharge only, preventing air intake.

2.15 Y STRAINERS - CLEAR PVC

A. Size 1/2 inch to 4 inch.

B. Features:
1. Clear PVC construction.
2. Seal Material: EPDM.
3. Replaceable 1/32 inch Type 316 stainless steel perforated screen and O-ring sealed drain plugs.
4. Easy screen access.
5. All threaded Y-strainers shall have special reinforced (SR) threads.
6. Horizontal or vertical installation.

C. Pressure Rating:
1. Size 1/2" to 2": Rated to 150 psi.
2. Size 3" to 4": Rated to 90 psi.

2.16 PRESSURE GAUGES

A. Manufacturers:
1. Ashcroft; Model 1009AW.

B. Acceptable manufacturers:
1. Omega: www.Omega.com
2. Enerpac: www.Enerpac.com

C. Provide with "PLUS" performance option - liquid filled performance in a dry gauge.

D. Accuracy: 1% full-scale accuracy ASME grade 1A.

E. Construction:
1. Case & Ring Material: 304 stainless steel.
2. Connection: Bronze.
3. Tube Material: Stainless steel.
4. Window: Polycarbonate.

F. Sensing Element: Bourdon tube.

G. Dial Standard: psi.

H. Dial: Brushed aluminum.

I. Dial Size: 3-1/2 inch.

J. Lower Connection: 1/4 inch NPT.

K. Range: 0 to 60 psi.

L. Smallest Gradation: 1 psi.

2.17 COMPOUND PRESSURE GAUGES

A. Manufacturers:

1. Ashcroft; Model 1009AW.

B. Acceptable manufacturers:

1. Omega: www.Omega.com
2. Enerpac: www.Enerpac.com

C. Provide with "PLUS" performance option - liquid filled performance in a dry gauge.

D. Accuracy: 1% full-scale accuracy ASME grade 1A.

E. Construction:

1. Case & Ring Material: 304 stainless steel.
2. Connection: Bronze.
3. Tube Material: Stainless steel.
4. Window: Polycarbonate.

F. Sensing Element: Bourdon tube.

G. Dial Standard: psi.

H. Dial: Brushed aluminum.

I. Dial Size: 3-1/2 inch.

J. Lower Connection: 1/4 inch NPT.

K. Range: 30" Hg VAC to 60 psi.

L. Smallest Gradation: 1 psi.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 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 or unions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. In all piping except air and gas piping, insulating fittings shall be provided to prevent contact of dissimilar metals, including but not limited to, contact of copper, brass, or bronze pipe, tubing, fittings, valves, or appurtenances, or stainless steel pipe, tubing, fittings, valves, or appurtenances with iron or steel pipe, fittings, valves, or appurtenances. Insulating fittings shall also be provided to prevent contact of copper, brass, or bronze pipe, tubing, fittings, valves or appurtenances with stainless steel pipe, tubing, fittings, valves, or appurtenances.

C. To prevent thread galling, apply anti-galling lubricant to all stainless steel hardware.

D. Route piping in orderly manner and maintain gradient. Install piping free of sags, bends, and kinks. Route parallel and perpendicular to walls.

E. Install fittings in changes in direction and branch connections in hard drawn copper tube.

F. All piping within structures shall be arranged, and facilities provided, for complete drainage.

G. Tee fitting sizes shall match that of the largest connecting pipe size.

H. Install piping to maintain headroom, conserve space, and not interfere with use of space.

I. All piping serving metering equipment shall be uniformly graded so that air traps are eliminated and complete venting is provided.

J. Taps for pressure gauge connections on the suction and discharge of pumping units shall be provided with a nipple and a ball type shutoff valve.

K. Buried PVC piping shall be "snaked" in the trench and shall be kept as cool as possible during installation. PVC pipe shall be kept shaded and shall be covered with backfill immediately after installation.

L. All chemical piping shall be installed so that lines are readily accessible for cleaning. Tees shall be provided at changes in direction in all chemical piping except chlorine piping, with extra openings plugged, to facilitate cleaning. Teflon thread tape or teflon thread sealer shall be applied to the threads of the plugs so that they can be easily removed. At each point where hose or reinforced plastic tubing is connected to rigid piping, a quick-disconnect coupling shall be provided.

M. Group piping whenever practical at common elevations.

N. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

O. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 22 07 19.

P. Establish elevations of buried water supply piping outside the building to ensure not less than 3.5 ft of cover.

Q. Provide support for utility meters in accordance with requirements of utility companies.

R. Excavate in accordance with Section 31 23 16.

S. Backfill in accordance with Section 31 23 23.

T. Install bell and spigot pipe with bell end upstream.

U. Install valves with stems upright or horizontal, not inverted, unless indicated on the plans.

V. Install water piping to ASME B31.9.

W. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

X. All pipes passing through structures shall be cast-in-place unless specifically noted otherwise on Drawings.

Y. Inserts:

1. Provide inserts for placement in concrete formwork.
2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

Z. Pipe Hangers and Supports:

1. Install in accordance with ASME B31.9.
2. Support Schedule 40 PVC and CPVC piping as scheduled following:
   a. 1/4" Diameter: Every 3'-0" minimum.
   b. 1/2" Diameter: Every 3'-6" minimum.
   c. 3/4" Diameter: Every 4'-0" minimum.
   d. 1" Diameter: Every 4'-6" minimum.
   e. 1-1/4" Diameter: Every 4'-6" minimum.
   f. 1-1/2" Diameter: Every 5'-0" minimum.
   g. 2" Diameter: Every 5'-0" minimum.
   h. 2-1/2" Diameter: Every 5'-6" minimum.
   i. 3" Diameter: Every 6'-6" minimum.
   j. 4" Diameter: Every 6'-6" minimum.
   k. 6" Diameter: Every 7'-6" minimum.
   l. 8" Diameter: Every 8'-6" minimum.
   m. 10" Diameter: Every 9'-0" minimum.
   n. 12" Diameter: Every 9'-6" minimum.
3. Support Schedule 80 PVC and CPVC piping as scheduled following:
   a. 1/4" Diameter: Every 4'-0" minimum.
   b. 1/2" Diameter: Every 4'-6" minimum.
   c. 3/4" Diameter: Every 4'-6" minimum.
   d. 1" Diameter: Every 5'-0" minimum.

e. 1-1/4" Diameter: Every 5'-0" minimum.

f. 1-1/2" Diameter: Every 5'-6" minimum.

g. 2" Diameter: Every 6'-0" minimum.

h. 2-1/2" Diameter: Every 6'-0" minimum.

i. 3" Diameter: Every 7'-0" minimum.

j. 4" Diameter: Every 7'-6" minimum.

k. 6" Diameter: Every 9'-0" minimum.

l. 8" Diameter: Every 9'-6" minimum.

m. 10" Diameter: Every 10'-0" minimum.

n. 12" Diameter: Every 11'-6" minimum.

o. 14" Diameter: Every 12'-6" minimum.

4. Place hangers within 12 inches of each horizontal elbow.

5. Provide copper plated hangers and supports for copper piping.

AA. Auxiliary Drill & Tap Connections:

1. Sch 80 fittings may be drilled and tapped for auxiliary connections provided the following limitations are adhered to in order to ensure proper fitting and joint integrity are maintained.

a. 1/8" and 1/4" tapped connections may be made only on 2" and larger nominal size fittings. 1/2" tapped connections may be made only on 4" and larger fittings. 3/4" tapped connections may be made only on 6" and larger fittings.

b. Tapped connections must be located in the double-walled solvent cement joint between the fittings and pipe. Do not tap through the fitting wall at any other location.

c. Tap center must be located at the lower 1/3 of the fittings socket depth. Do not locate tap center in the upper 2/3 of the joint or at the very bottom of the socket.

d. Drill appropriate pilot hole squarely through the fitting and pipe wall using moderate speed to prevent distortion of the plastic material. Hand tapping is recommended to likewise prevent distortion and possible thread damage. Do not use a drill for tapping.

e. Tap dry or with water only. Do not use any cutting oils in the tapping process. These can induce stress cracking in plastics.

f. Threaded connections must be made using a thread sealant as approved by the pipe manufacturer. The use of thread sealants not approved by the pipe manufacturer may cause stress cracking in plastics.

3.04 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

C. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

D. Install ball or butterfly valves for throttling, bypass, or manual flow control services.

E. Provide plug valves in natural gas systems for shut-off service.

3.05 TOLERANCES

A. When pipe elevations are shown on the Drawings, the pipe shall uniformly slope between the given elevations. If Contractor believes additional change in direction fittings are required in order to achieve the slopes shown, then Contractor shall notify Engineer prior to installation.

B. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

C. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.06 PRESSURE AND LEAKAGE TESTING

A. All specified tests shall be made by and at the expense of the Contractor in the presence, and to the satisfaction of the Engineer.

B. Each piping system shall be tested for at least 1 hour and with no loss of pressure.

C. Piping shall be tested at the following pressures:

1. Recirculation Piping:
   a. Test Pressure: 1-1/2 times working pressure but not less than 50 psi.
   b. Test Medium: Water.
2. Water Supply:
   a. Test Pressure: 1-1/2 times working pressure but not less than 120 psi.
   b. Test Medium: Water.
3. Gas Supply:
   a. Test Pressure: 1-1/2 times working pressure but not less than 60 psi.
   b. Test Medium: Compressed air.
4. Other Piping:
   a. Test Pressure: 1-1/2 times working pressure but not less than 50 psi.
   b. Test Medium: Suitable fluid or gas.

D. Compressed air or pressurized gas shall not be used for testing plastic piping unless specifically recommended by the pipe manufacturer.

E. Leakage may be determined by loss-of-pressure, soap solution, chemical indicator, or positive and accurate method acceptable to the Engineer. All fixtures, devices, or accessories which are to be connected to the lines and which would be damaged if subjected to the specified test pressure shall be disconnected and the ends of the branch lines plugged or capped as required

during the testing.

F. All necessary testing equipment and materials, including tools, appliances and devices, shall be furnished and all tests shall be made by and at the expense of the Contractor and at the time directed by the Engineer.

G. All joints in piping shall be tight and free of leaks. All joints which are found to leak, by observation or during any specified test, shall be repaired, and the tests repeated.

3.07 CLEANING

A. The interior of all pipe, valves, and fittings shall be smooth, clean, and free of blisters, loose mill scale, sand, dirt, and other foreign matter when installed. Before being placed in service, the interior of all lines shall be thoroughly cleaned, to the satisfaction of the Engineer.

3.08 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.

3.09 SERVICE CONNECTIONS

A. Provide new sanitary and storm sewer services. Before commencing work check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

B. Provide new water service complete with approved reduced pressure backflow preventer and water meter with by-pass valves, pressure reducing valve, and sand strainer.

C. Provide new gas service complete with gas meter and regulators. Gas service distribution piping to have initial minimum pressure of 11 inch wg or as required for the equipment. Provide regulators on each line serving gravity type appliances, sized in accordance with equipment.

END OF SPEC SECTION 131190

SECTION 13 11 92
PLUMBING SPECIALTIES FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hose bibbs.

B. Drain valves.

C. Backflow preventers.

D. Water meter for water fill or water make-up.

E. Emergency eye/face wash and shower.

1.02 RELATED REQUIREMENTS

A. Section 13 11 90 - Piping and Valves for spray grounds

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 PRODUCTS

2.01 HOSE BIBBS

A. Manufacturers:

1. Woodford Manufacturing Company: Tel: (719) 574-1101; Fax: (719) 574-7621; www.woodfordmfg.com.
2. Zurn Industries, Inc; Model: www.zurn.com.

B. Hose Bibbs:

1. Specified Manufacturer: Woodford Manufacturing Company; Model 21: Tel: (719) 574-1101; Fax: (719) 574-7621; www.woodfordmfg.com.
2. Automatic draining with anti-siphon vacuum breakers.
3. Vacuum Breaker - Anti-Siphon: Nidel Model 34HF with 3/4 inch male hose thread, approved under ASSE Standard 1011.
4. Packing: EPDM.
5. Packing Nut: Adjustable brass nut with deep stem guard.
6. Valve Seat: Standard "O" size washer.

7. Handles: Furnished with metal wheel handle.
8. Inlets: 3/4 inch, unless noted otherwise.
9. Finish: Rough brass.

2.02 DRAIN VALVES

A. Specified Manufacturer: Woodford Manufacturing Company; Model 21CP: Tel: (719) 574-1101; Fax: (719) 574-7621; www.woodfordmfg.com.
B. Exterior Finish: Brass.
C. Packing: Teflon impregnated packing.
D. Packing Nut: Adjustable brass nut with deep stem guard.
E. Valve Seat: Standard "O" size washer.
F. Handles: Furnished with polycarbonate wheel handle.

2.03 HORIZONTAL BACKWATER VALVE

A. Manufacturers:
   1. Specified Manufacturer: Spears Manufacturing: www.spearsmfg.com. Utility Backwater Valve.
   2. Acceptable Manufacturer: Sioux Chief Manufacturing Company; Series 869; Tel: (800) 821-3944; Fax: (800) 758-5950; www.siouxchief.com.
B. Construction:
   1. Constructed from PVC Type I Cell Classification 12454 conforming to ASTM D 1784.
   2. Seats shall be EPDM.
   3. Threaded top plug for convenient service.
   4. Snap-in internal flapper assembly for easy replacement.
   5. Valves shall have external arrow flow indicator.
   6. Pressure rated at 50 psi for water at 73 degrees F.
C. Service-Access Extension Kit: Provide factory assembled service-access extension kit where required for servicing or where called for on the Drawings.

2.04 REDUCED PRESSURE BACKFLOW PREVENTERS

A. Sizes: 1/4" to 2":
   1. Specified Manufacturer: Watts Regulator Company; Series 009QT: www.wattsregulator.com.
   2. The assembly shall meet the requirements of ASSE 1013 and AWWA C-511-97.
   3. The assembly shall have a bronze body with bronze internal parts and stainless steel springs.
   4. The assembly shall consist of a pressure differential relief valve located in a zone between two positive seating check valves.

5. Backsiphonage protection shall include provision to admit air directly into the reduced pressure zone via a separate channel from the water discharge channel, or directly into the supply pipe via a separate vent.
6. The assembly shall include two tightly closing, quarter-turn, full port, resilient seated, bronze body, ball valve shutoffs before and after the assembly, bronze body test cocks and a bronze protective strainer upstream of the No. 1 shutoff valve.

2.05 WATER METER FOR WATER FILL OR WATER MAKE-UP

A. Manufacturer: Dwyer Instruments, Inc.; Series WNT: Tel: (219) 879-8000; www.dwyer-inst.com.
B. Wetted Materials:
   1. Body: Brass.
   2. Couplings: Brass.
   3. Measuring Chamber: ABS Plastic.
C. Flow Range (for 1" model): 50 gpm max; 3-50 gpm nominal; 0.75 gpm transitional.
D. Accuracy: +/-3% transitional flow; +/-1.5% nominal flow.
E. Temperature Limit: 122 degrees F.
F. Pressure Limit: 150 psi.
G. Totalizing Display Maximum: 9,999,999.99 gal.
H. Output Signal: Pulse output with frequency proportional to flow rate.
I. Pulse Options: 0.1 gal, 1 gal, 10 gal, 100 gal per pulse.
J. Electrical Rating: 0.01A @ 24 VAC/DC.
K. Electrical Connections: Color-coded lead wires 4.5 feet long.
L. Mounting Orientation: Horizontal with register facing up.
M. Agency Approvals: NSF/ANSI 61.
N. Size: As indicated on drawings.

2.06 EMERGENCY EYE/FACE WASH AND SHOWER

A. Specified Manufacturer: Guardian Equipment; Model G1993: Tel: (312) 447-8100.
B. Acceptable manufacturers:
   1. Haws: www.Hawsco.com
   2. Bradley: www.BradleyCorp.com
      a. Application:
         1) All PVC and PVC-coated combination eye/face wash and shower safety station.
      b. Shower:
         1) Head: 10"-diameter orange ABS plastic.
         2) Valve:
            (a) 1" IPS PVC-coated brass stay-open ball valve.

(b) Chrome-plated brass ball.

(c) Teflon seals.

(d) Stainless steel actuating arm and 29" stainless steel pull rod.

3) Spray head assembly: Internal flow control and filter to remove impurities from water.

c. Eye/Face Wash:

1) Bowl: 11-3/4" orange ABS plastic.

2) Valve:

(a) 1/2" IPS PVC-coated brass stay-open ball valve.

(b) Chrome-plated brass ball.

(c) Teflon seals.

3) Mixing Valve

(a) Provide G3800 LF Thermostatic mixing valve

d. Pipe and Fittings: Schedule 80 PVC.

e. Supply: 2" IPS socket weld top female inlet.

f. Waste: 2" IPS socket weld female outlet.

g. Sign: Furnished with ANSI-compliant identification sign.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.

C. Encase exterior cleanouts in concrete flush with grade.

D. Install floor cleanouts at elevation to accommodate finished floor.

E. Install approved potable water protection devices on all plumbing lines where contamination of domestic water may occur.

F. A reduced pressure zone backflow preventer shall be installed at each cross connection to prevent backsiphonage and back-pressure backflow of hazardous materials into the potable water supply.

G. Pipe relief from backflow preventer to nearest drain with approved air-gap.

H. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom). Fabricate same size as supply pipe or 3/4 inch minimum, and minimum 18

inches long.

END OF SPEC SECTION 131192

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SECTION 13 11 94
MECHANICAL IDENTIFICATION FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.

B. Tags.

C. Pipe Markers.

1.02 SUBMITTALS

A. See 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Brady Corporation: www.bradycorp.com.

B. Champion America, Inc.: www.Champion-America.com.

C. Kolbi Pipe Markers, Inc.: www.kolbipipemarkers.com.

D. Marking Services Inc. (MSI): www.markserv.com.

E. Seton Identification Products: www.seton.com/aec.

2.02 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved letters.

2.03 VALVE TAGS

A. Plastic Tags: Laminated three-layer plastic with engraved letters. Tag size minimum 1-1/2 inch diameter.

B. Valve Tag Securing Devices: Plastic zip tie; provide one securing device for each tag.

2.04 PIPE MARKERS

A. Plastic Pipe Markers: Factory fabricated, flexible, semi- rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

3.02 INSTALLATION

A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install tags with corrosion resistant chain.

C. Install plastic pipe markers in accordance with manufacturer's instructions.

D. Identify all pumps, heaters, filters tanks, with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.

E. Identify all valves in exposed recirculation piping and remote pits with tags.

F. Identify exposed piping with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service and flow direction. 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.

3.03 SCHEDULES

A. Nameplates:

B. Valve Tags:

1. Identification: Each valve tag shall have the words identified below. Valve tags with codes or abbreviations are not acceptable.

   a. Air Release Valve: Located on all ball valves used to release air from hydraulic system.

   b. Automatic Air Release Valve: Located on top of filters and at high points of piping system to automatically release air.

   c. Backwash Isolation Valve: Located on the filter face piping to backwash filter.

   d. Backwash Throttling Valve: Located on the pipe run from the filter face piping to the backwash pit.

   e. Bypass Valve: Located on a pump discharge pipe to bypass water flow back into a wet pit.

   f. Check Valve: Locate on all check valves.

   g. Drain Valve or Drain Plug: Locate on all valves or plugs used for drainage.

   h. Filter Effluent Valve: Located on discharge side of filters.

   i. Filter Influent Valve: Located on filter face piping directly before filter.

   j. Isolation Valve: Located before and after equipment including pumps, strainers, etc.

   k. Manual Fill Valve: Locate on valve used to fill pit.

   l. Drain Valve: Used to drain water out of the basin, generally through the main drain.

   m. Recirculation Throttling Valve: Located on recirculation piping after the filters.

   n. Solenoid Valve: Valve that is electrically operated.

   o. "WATER FEATURE NAME" Throttling Valve (e.g. Open Flume Slide Throttling Valve, Drop Slide Throttling Valve, Bubbler): Located on individual water feature valves downstream of pump.

p. Other: Provide valve tags for all other valves not specifically identified above. Verify wording with Engineer.

2. Background:

a. Size: As required.

b. Color: To match color of pipe markers for the respective pipe - see pipe marker schedule below.

3. Lettering:

a. Color: To match color of pipe markers for the respective pipe - see pipe marker schedule below.

b. Height: 1/4 inch.

C. Pipe Markers: Unless otherwise required by local codes, the color codes for piping shall be as follows.

1. Air Release Piping: All piping used to manually or automatically release air.

a. Identification: Air Release.

b. Background:

1) Size: As required.

2) Color:

(a) Piping on filter influent piping or top of filters: Olive Green.

(b) Piping on filter effluent piping: Aqua.

c. Lettering:

1) Color: White.

2) Height: 1/2 inch.

2. Chemical Controller Sample Lines:

a. Chemical Controller Return: Sample coming from the chemical controller.

1) Identification: Chemical Controller Return.

2) Background:

(a) Size: As required.

(b) Color: Aqua.

3) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

b. Chemical Controller Supply: Sample line going to the chemical controller.

1) Identification: Chemical Controller Supply.

2) Background:

(a) Size: As required.

(b) Color: Aqua.

3) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

3. Chemical Piping:

a. Identification: "CHEMICAL NAME" (e.g. Muriatic Acid, Sodium Hypochlorite, Chlorine Gas, Caustic Soda).

b. Background:

1) Size: As required.

2) Color:

(a) Chlorine (gas or solution): Yellow.

(b) Soda Ash: White.

(c) Acid: Pink.

(d) Caustic: Yellow with Green Band.

c. Lettering:

1) Color: Black.

2) Height: 1/2 inch.

4. Domestic Water:

a. Deck Hose Bibb Supply: Locate on exposed deck hose bibb supply pipes where exposed for distances of greater than 5' or when pipe penetrates multiple structures.

1) Identification: Deck Hose Bibb.

2) Background:

(a) Size: As required.

(b) Color: Dark Blue.

3) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

b. Fill: Locate on all manual fill piping.

1) Background:

(a) Size: As required.

(b) Color: Dark Blue.

2) Lettering:

(a) Color: White.

(b) Height: 1 inch.

c. Water Make-Up: Locate on all automatic water make-up piping.

1) Background:

(a) Size: As required.

(b) Color: Dark Blue.

2) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

d. Water Service: Locate on potable water service piping only where exposed for distances of greater than 3' or when pipe penetrates multiple structures.

1) Identification: Water Service.

2) Background:

(a) Size: As required.

(b) Color: Dark Blue.

3) Lettering:

(a) Color: White.

(b) Height: 1 inch.

5. Filter Backwash: Filter backwash piping.

a. Identification: Filter Backwash.

b. Background:

1) Size: As required.

2) Color: Dark Brown.

c. Lettering:

1) Color: White.

2) Height: 2 inch.

6. Main Drain Piping: Locate on main drain piping only where the pipe is exposed for distances of greater than 5'. If less than 5' of pipe is exposed, locate on penetrating wall(s) immediately above the pipe.
    a. Background:
        1) Size: As required.
        2) Color: Black.
    b. Lettering:
        1) Color: White.
        2) Height: 2-1/2 inch.
7. Recirculation Piping:
    a. Filter Effluent Piping: Piping after filters.
        1) Background:
            (a) Size: As required.
            (b) Color: Aqua.
        2) Lettering:
            (a) Color: White.
            (b) Height: 2 inch.
    b. Filter Influent Piping: Piping between recirculation pump and filter.
        1) Background:
            (a) Size: As required.
            (b) Color: Olive Green.
        2) Lettering:
            (a) Color: White.
            (b) Height: 2 inch.
8. Sump Pump Discharge Piping:
    a. Backwash Sump Pump Discharge Piping: Exposed piping on backwash sump pump discharge.
        1) Identification: Backwash Sump Pump.
        2) Background:
            (a) Size: As required.
            (b) Color: Dark Brown.

3) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

b. Sump Pump Discharge Piping: Exposed piping on sump pump discharge piping to storm sewer.

1) Identification: Sump Pump.

2) Background:

(a) Size: As required.

(b) Color: Light Brown.

3) Lettering:

(a) Color: White.

(b) Height: 1/2 inch.

9. Water Feature Piping: Piping to water features.

a. Identification: "WATER FEATURE NAME" (e.g. Open Flume Water Slide, Drop Slide, Bubbler).

b. Background:

1) Size: As required.

2) Color: Olive Green.

c. Lettering:

1) Color: White.

2) Height: 1/2 inch on small pipe, 2 inch on large pipe.

END OF SPEC SECTION 131194

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SECTION 13 14 20
WATER SPRAY FEATURES FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water spray features.

1.02 PRE-QUALIFICATION REQUIREMENTS

A. The Contract Documents are based on providing the products of the Specified Manufacturer. Acceptable Manufacturers shall have their proposed substitute products submitted to Engineer at least 14 days prior to bidding in order to be considered for this project. If approved by Engineer, notification will be indicated in an Addendum.

B. Acceptable Manufacturers shall submit their proposed substitute for each of the products specified including the following:

1. A point-by-point comparison of the proposed substitute products to that of the Specified Manufacturer's products. Comparison shall include, but not necessary limited to, materials of construction, flow requirements, operating pressure requirements, installation requirements, and anchor base details.
2. Specific written notice of any and all variations of the proposed substitute with that of the Specified Manufacturer.
3. A colored picture of each product or feature while in use or operation.
4. A list of references including project location, project completion date, and contact name and phone number.

C. Substitute products shall provide the same water effect and similar hydraulic performance as the product specified.

D. All quantities of each product shall match that being provided by the Specified Manufacturer.

E. All piping, fittings, valves, and appurtenances shall be as indicated on the drawings and all costs for materials and installation for a complete and operating piping system shall be included in the Bid. If deviations are required for a specific manufacturer's product, the Engineer will indicate such deviation in an Addendum as part of the manufacturer's approval. The necessary cost add or deduct for such indicated changes shall be included in the bid.

F. If this section includes a wireless systems by the Specified Manufacturer and the Acceptable Manufacturer can not provide a wireless system, then the Acceptable Manufacturer shall indicate so in the pre-qualification submittal. If a hard-wired system is approved by Engineer, Contractor shall be responsible for providing all necessary conduit, conductors, junction boxes, etc. for a complete and operating system in accordance with the Acceptable Manufacturers requirements.

1.03 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's descriptive literature for specified systems, including all components.

C. Shop Drawings: Indicate component connection details and details of interface with adjacent construction.

D. Certificates: Certify that products of this section meet or exceed specified requirements.

E. Manufacturer's Instructions: Indicate installation instructions for specified equipment, including each component.

F. Operation and Maintenance Data: Submit manufacturer's maintenance instructions and parts lists for specified equipment.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of experience.

C. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Delivery: Deliver materials to site in manufacturer's original, unopened packaging.

B. Storage: Store all equipment and materials under cover and elevated above grade.

C. Protection: Protect equipment and materials to prevent damage.

1.06 WARRANTY

A. Stainless steel pipe and anchor bases shall be warranted against structural failure for a period of 25 years.

B. Coatings shall be warranted for a period of 2 years against peeling or fading, under normal environmental conditions.

C. Controllers, Valve Boxes, and Fiberglass Components:

1. Dynamic Sequencing Control Module 02-6210 shall be warranted against defects for a period of 3 years. All other dynamic sequencing controllers shall be warranted against defects for a period of 1 year.
2. Valve boxes and fiberglass components shall be warranted against defects for a period of 3 years.

D. Nozzles shall be warranted for a period of 5 years.

E. Polyurethane components shall be warranted for a period of 2 years.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Specified Manufacturer: Vortex Aquatic Structures International; Tel: (514) 694-3868; Fax: (514) 335-5414; www.vortex-intl.com.

B. Acceptable Manufacturers: Acceptable Manufacturers shall have their proposed substitute products submitted to Engineer in accordance with Part 1 - Pre-Qualification Requirements of this Section.

1. Aquatix by Landscape Structures; 6500 Eden Prairie, MN 55346-1729: Tel: (877) 632-0503; Fax: (952) 345-6444.
2. Water Odyssey play elements manufactured by The Fountain People, Inc.: Tel: (512) 392-1155; www.waterodyssey.com.
3. Waterplay Manufacturing Inc.; 1451 B. Ellis St., Kelowna, BC V1Y 2A3: Tel: (800) 590-5552 or (250) 712-3393; Fax: (250) 861-4814; www.waterplay.com.

2.02 WATER SPRAY FEATURES

A. Vortex:

1. GloMist Nano: VOR 7248
   a. Provide Toeguard
2. Jet Stream No.2 : VOR 0325
3. Directional Jet No.3 : VOR 0335
4. Wave: VOR 0327
   a. Spray Height: 4' to 5'.
5. SprayLink Jet No.1 : VOR 3000

2.03 DRAIN

A. WaterOdyssey: Decorative Drain Model (H):

1. 13" diameter
2. Flow requirement: 50 GPM drainage capacity.

2.04 FEATURE LIGHTING

A. Vortex: LED Lighting VOR 7056

1. Provide required power supply and controls.

2.05 ACTIVATOR

A. Vortex: Bollard Activator No.4

1. Dimension: 37 H /14 W /14 L inches
2. Color: color selected by engineer and Owner
3. Electrical: Required Cable 2 wires 22-26AWG (provided by installer)
4. Provide Toeguard

2.06 MANIFOLD

A. Distribution Header: Type 304 stainless steel pipe.

B. Solenoid Valves: Die cast bronze with 15' cord and 24 volt AC UL recognized solenoid.

C. Balancing Valves: True union ball valve, Schedule 80 PVC.

D. Inlet Isolation Valve: True union ball valve, Schedule 80 PVC.

E. Water Hammer Arrestor: copper and brass construction with pre-set operating pressure 10-35 psi.

F. Drain Valve: 3/4 inch cast bronze hose bibb located on the bottom of the header.

G. Pressure Gauge: Discharge Pressure Gauge: Tru-Tel #3550BC4L1D6F, 0 to 60 psi.

H. A. HDG, S.S. or FRP channel support system

2.07 CONTROLLER

A. Maestro Intelligent Water Control

1. Rain sensor
2. Wind sensor

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that required utilities are in correct location and are of correct capacities for specified products.

B. Verify equipment rough-in before proceeding with work.

3.02 INSTALLATION

A. Install all equipment in accordance with shop drawings and manufacturer's printed installation instructions; comply with standards required by authorities having jurisdiction.

B. Schedule installation to ensure that utility connections are achieved in an orderly and expeditious manner.

C. Install equipment plumb, square, and straight, without distortion; securely anchor.

3.03 INTERFACE WITH OTHER WORK

A. Coordinate with other trades for proper installation of plumbing and electrical services.

3.04 STARTING EQUIPMENT AND SYSTEMS

A. Provide manufacturer's field representative to prepare and start equipment.

B. Adjust for proper operation within manufacturer's published tolerances.

C. Demonstrate proper operation of equipment to Owner's designated representative.

3.05 ADJUSTING AND CLEANING

A. Adjust equipment, including water requirements, for smooth operation.

B. Touch up minor damaged surfaces caused by installation.

C. Replace damaged components as directed by Engineer.

3.06 CLEANING AND PROTECTION

A. Clean all pieces of equipment.

B. Protect installed equipment from subsequent construction operations.

C. Do not permit traffic over unprotected surfaces.

END OF SPEC SECTION 131420

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SECTION 31 23 16
EXCAVATION FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for volume below grade, building volume below grade, footings, slabs-on-grade, paving, and site structures.

1.02 RELATED REQUIREMENTS

A. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring. General requirements for dewatering of excavations and water control.

B. Section 3120000 Earth Moving

C. Section 31 23 23 - FILL AND BACKFILL FOR SPRAY GROUNDS: Fill materials, backfilling, and compacting.

D. Section 33 46 10 - SUBDRAINAGE FOR SPRAY GROUNDS: Filter aggregate and filter fabric for foundation drainage systems.

1.03 PROJECT CONDITIONS

A. Protect plants, lawns, rock outcroppings, and other features to remain.

B. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 31 22 00 for topsoil removal.

C. Locate, identify, and protect utilities that remain and protect from damage.

D. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Engineer.

3.02 EXCAVATING

A. Classification of Excavated Materials: No classification of excavated materials will be made. Excavation and trenching work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the work, regardless of the type, character, composition, or condition thereof.

B. Blasting: Blasting or other use of explosives for excavation will not be permitted.

C. Excavate to accommodate new structures and construction operations.

D. Notify Engineer in writing of unexpected subsurface conditions. Do not further disturb such condition or perform any Work in connection therewith until receipt of written order to do so.

E. Design any excavation slopes or temporary shoring.

F. Slope height, slope inclination, and excavation depths, including utility trench excavations, should in no case exceed those specified in federal, state, or local safety regulations, such as OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations.

G. Do not interfere with 45 degree bearing splay of foundations.

H. Dewatering:

1. Dewatering equipment shall be provided to remove and dispose of all surface water and groundwater entering excavations, trenches, or other parts of the work.
2. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe to be installed therein, is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result.
3. All excavations for concrete structures or trenches which extend down to or below groundwater shall be dewatered by lowering and keeping the groundwater level beneath such excavations 12 inches or more below the bottom of the excavation. For Contractor's convenience and at Contractor's cost, Contractor may stabilize saturated soils using means other than dewatering, with prior approval of Engineer. Other methods may include over-excavation and/or application of fill materials. Under no circumstance shall Contractor employ fill materials that results in open voids in the subgrade, which could be later filled in with silts and fines causing settlement of the subgrade.
4. Surface water shall be diverted or otherwise prevented from entering excavations or trenches to the greatest extent possible without causing damage to adjacent property.
5. The Contractor shall be responsible for the condition of any pipe or conduit which he may use for drainage purposes, and all such pipe or conduit shall be left clean and free of sediment.

I. Provide temporary means and methods, as required, to remove all water from excavations until directed by Engineer. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces by Engineer before placement of foundations.

3.04 PROTECTION

A. Divert surface flow from rains or water discharges from the excavation.

B. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

C. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition.

D. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

E. Keep excavations free of standing water and completely free of water during concrete placement.

END OF SPEC SECTION 312316

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SECTION 31 23 23
FILL AND BACKFILL FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for volumes below grade, building volume below grade, footings, slabs-on-grade, paving, site structures, and utilities within the building.

1.02 RELATED REQUIREMENTS

A. Section 131115 - Cast in place concrete for spray grounds

B. Section 312000 - Earth Moving

C. Section 334610 - Subdrainage for spray grounds

1.03 REFERENCE STANDARDS

A. ASTM C 33 - Standard Specification for Concrete Aggregates; 1999a.

B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012.

C. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2015, with Editorial Revision (2016).

D. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2008.

E. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.

F. ASTM D 4253 - Standard Test Methods for Maximum Index Density and Unit Weight Soils Using a Vibratory Table; 2000.

G. ASTM D 4254 - Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density; 2000.

H. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2009.

I. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2008.

J. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2004.

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Soil Samples: 10 pounds sample of each type of fill; submit in air-tight containers to testing laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill.

E. Compaction Density Test Reports.

F. Testing shall be completed by an independent testing agency and shall be less than 12 months old. The costs for material tests shall be paid for by the Owner.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Provide sufficient quantities of fill to meet project schedule and project requirements. When necessary, store materials on site in advance of need.

B. When fill materials are stored on site:

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.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Imported borrow meeting all of the following requirements:

1. Free of lumps larger than 3 inches, rocks larger than 2 inches, organics and debris.
2. Conforming to ASTM D 2487 Group Symbol SC, CL, ML, SM, or GC.

B. Structural Fill: Imported borrow meeting all of the following requirements:

1. Free of lumps larger than 1.5 inches, rocks larger than 1.5 inches, organics, and debris.
2. Fill shall consist of low-plasticity cohesive material or granular material containing at least 18 percent fines.
3. Low-plasticity cohesive fill shall have a liquid limit (LL) less than 40 and a plasticity index (PI) between 10 and 20 in accordance with ASTM D 4318 by the wet preparation method.
4. Conforming to ASTM D 2487 Group Symbol CL.

C. Concrete for Fill: See Section 03 30 00; compressive strength of 2,500 psi.

D. Granular Fill: Granular fill for compacted backfill shall be free-draining, poorly graded, clean, angular crushed stone; free of shale, clay, friable material and debris.

1. Gradation: Comply with ASTM C 33, Table 2 Grading Requirements for Coarse Aggregate, size No. 57 or 67 aggregate.
2. The fraction passing the No. 200 sieve shall not exceed 5 percent.

E. Underdrain Aggregate - Pea Gravel : Natural stone; washed, free of clay, shale, organic matter.

1. Graded in accordance with ASTM C 136, within the following limits:
   a. Minimum Size: 3/8 inch.
   b. Maximum Size: 3/4 inch.

F. Topsoil: See Section 31 22 00.

2.02 ACCESSORIES

A. Geotextile Fabric:

1. Manufacturers and products:
   a. Contech C60NW.
   b. Propex Geotex 601.
   c. Mirafi 160N.
2. Properties:
   a. Tensile Strength (Grab), ASTM D 4632: 160 lbs.
   b. Apparent Opening Size, ASTM D 4751: 70 US Standard Sieve.
   c. Water Flow Rate, ASTM D 4491: 110 gpm/sq. ft.

2.03 SOURCE QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. All fill materials shall be approved by Engineer.

C. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site. The costs for material tests shall be paid for by the Contractor.

D. 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. See Section 31 22 00 for additional requirements.

C. Verify subdrainage, piping, dampproofing, or waterproofing installation has been inspected.

D. Verify structural ability of unsupported walls to support imposed loads by the fill.

E. Verify areas to be filled are not compromised with surface or ground water.

3.02 PREPARATION

A. Proof roll subgrade surface with a loaded tandem-axle dump truck, with a minimum gross weight of 25 tons, to identify soft spots. Construction equipment equipped with flotation tires, such as scrapers, skid-steers, and pay loaders, are not suitable for use in proof rolling.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with structural fill.

C. In areas to accept fill, the top 10 inches of the ground surface shall be scarified, moisture conditioned to -1 to 3 percent of the material's optimum moisture content. The scarified soils should then be recompacted to at least 95 percent of the material's standard Proctor dry density (ASTM D 698).

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Fill up to subgrade elevations unless otherwise indicated.

C. Employ a placement method that does not disturb or damage other work.

D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

E. In areas where a finer material is placed over or beside a coarser material and migration of one into the other can occur, such as when structural fill, general fill, or topsoil is placed over or beside granular fill, geotextile fabric shall be placed over or beside the granular fill or coarser material to separate the fill materials and prevent migration.

F. Fill at Walls: Carefully place and compact fill materials along walls in order to protect piping and conduit from damage due to material and equipment loading.

G. Upon completion of excavation and filling operations, care shall be taken to prevent subgrade disturbance and maintain the subgrade moisture content prior to construction of foundations and slabs. If the subgrade becomes saturated, desiccated, or disturbed, the affected material shall be removed and replaced, or these materials shall be scarified, moisture-conditioned as necessary, and recompacted prior to construction of foundations or slabs. If two (2) days elapses or a significant weather event occurs between subgrade preparation and further construction, subgrades shall be retested prior to placement of structures.

H. Compaction Method:

1. The method of compaction and the equipment used shall be appropriate for the material to be compacted and the work location.
2. Sheep's foot roller, smooth drum rollers, pneumatic tired rollers, jumping jacks, vibratory equipment, small rollers, tampers, or other appropriate equipment shall be used for compaction.
3. Compaction using loaded trucks, bulldozer tracks, backhoe buckets, or similar construction equipment shall not be allowed.

I. Moisture content, at the time of compaction, shall be controlled to between 1 percent below and 3 percent above the optimum moisture content.

J. For cohesionless fill materials, where the percent passing the No. 200 sieve is less than 10 percent and the moisture-density curve indicates only slight sensitivity to changing moisture content, compaction requirements should be changed to 75 percent relative density as determined by ASTM D 4253 and ASTM D 4254.

K. General Fill:

1. Deposit in uniform layers not exceeding 8 inches in uncompacted thickness.

2. Compact to 95 percent of maximum density at 1 percent below and 3 percent above the optimum moisture content, as determined by ASTM D 698 when that test is appropriate.

L. Structural Fill:

1. Deposit in uniform layers not exceeding 8 inches in uncompacted thickness.
2. Compact to 98 percent of maximum density at 1 percent below and 3 percent above the optimum moisture content, as determined by ASTM D 698 when that test is appropriate.

M. Granular Fill:

1. Granular material shall be deposited in uniform layers not exceeding 8 inches in uncompacted thickness.
2. The granular backfill shall be compacted with a suitable vibratory roller or platform vibrator to at least 98 percent of the materials standard Proctor dry density (ASTM D 698).

N. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

O. Correct areas that are over-excavated.

1. Load-bearing foundation surfaces: Fill with concrete.
2. Other areas: Use structural fill, flush to required elevation, compacted to minimum 95 percent of maximum dry density.

P. Reshape and re-compact fills subjected to vehicular traffic.

Q. 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.

3.04 FILL AT SPECIFIC LOCATIONS, UNLESS NOTED OTHERWISE ON DRAWINGS

A. General Fill: Use in landscape areas only.

B. Structural Fill: Use under all structures, where indicated, including but not necessarily limited to, slabs-on-grade, footings, and foundations.

C. Granular Fill: Use under all structures and at all other locations where indicated on the Drawings.

D. Underdrain Aggregate: Use for the subdrainage system only.

E. Buried Conduits and Piping in Trenches and _____:

1. Where pipe or conduit is not located under a structure:
   a. Bedding: Use granular fill up to top of pipe or conduit.
   b. Cover with general fill.
   c. Fill up to subgrade elevation.
2. Where pipe or conduit is located under a structure:
   a. Bedding: Use granular fill up to top of pipe or conduit.

b. Place separation geotextile fabric over granular fill.

c. Cover with structural fill.

d. Fill up to subgrade elevation.

3.05 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations, unless noted otherwise on the drawings.

3.06 FIELD QUALITY CONTROL

A. See Section 01 40 00 - 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 ASTM D698 ("standard Proctor").

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Tests: As noted below unless requested otherwise by Engineer.

1. All Areas Except Under Pavements:

a. Fill Materials: At least one (1) test per fill type per 1,000 cubic yards of fill placed. Each test shall include sieve, P.I., and moisture density relationship when appropriate for the fill type. Provide other testing required to determine conformance.

b. Compaction: At least one (1) field density test for each 2,000 square feet of fill lift, but no less than three (3) tests per lift.

2. Under Pavements:

a. Fill Materials: At least one (1) test per fill type per 2,500 cubic yards of fill placed. Each test shall include sieve, P.I., and moisture density relationship when appropriate for the fill type. Provide other testing required to determine conformance.

b. At least one (1) field density test per 5,000 square feet of fill lift, but no less than three (3) tests per lift.

F. Backfill operations shall be monitored full time by the testing and inspection agency.

G. Proof roll compacted fill at surfaces that will be under slabs-on-grade and paving.

3.07 CLEANING

A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SPEC SECTION 312323

SECTION 33 32 16 - PACKAGE GRINDER LIFT STATION

PART 1. GENERAL

1.1. SCOPE OF WORK

A. The work in this section shall include furnishing and placing into operation one (1) prefabricated sewage pump station complete with two (2) submersible grinder pumps, internal piping, lifting chains, guide rails and access covers as specified herein and as indicated on the drawings. Packaged lift station shall be a prefabricated pump station including submersible grinder pumps, prefabricated fiberglass basin, control panel and associated remote dialer supplied as a package by a single supplier

B. The manufacturer shall furnish a complete factory-built and tested duplex grinder pump station consisting of grinder pumps suitably mounted in a basin constructed for fiberglass or high-density polyethylene (HDPE), electrical quick disconnect (NEMA 4X), pump removal system, shut-off valve, anti-siphon valve, and check valve assembled within the basin.

1.2. REFERENCES

A. American Society for testing and material (ASTM) International

1. A 48: Standard Specification for Gray Iron Castings.
2. A743: Standard Specification Iron-Chromium Nickel, Corrosion Resistant,

B. American National Standards Institute (ANSI):

1. B16.1: Standard for Cast Iron Pipe Flanges and Flanged Fittings, 125 lb.

C. Hydraulic Institute: Current Standards.

1. HI 14.6: Hydrodynamic Pumps for Hydraulic Performance Acceptance Tests.
2. HI 11.6: Submersible Pump Tests

1.3. SUBMITTALS

A. Submittal data shall be provided to show compliance with these specifications, plans or other specifications that will influence the proper operation of the pump(s).

B. Standard submittal data for approval must consist of:

1. Pump Performance Curves.
2. Pump Outline Drawing.
3. Station Drawing for Accessories.
4. Electrical Motor Data.
5. Typical Installation Guides.
6. Technical Manuals and Parts List.
8. Printed Warranty.
9. Management system certificate ISO 9001.
10. Manufacturer's Equipment Storage Recommendations.
11. Manufacturer's Standard Recommended Start-Up Report Form.
12. Manufacturer's Recommended Spare Parts List
13. The Manufacturer shall supply two (2) copies of Operation and Maintenance Manuals to the Owner, and one (1) copy of the same to the Engineer.

C. Lack of the above requested submittal data is cause for rejection.

D. The manufacturer, if requested, will supply a minimum of 3 sets of additional submittal data. Additional submittal data consist of:

1. Pump catalog data;
2. Break away fitting data
3. Access frame data
4. Typical installation drawing
5. Control panel data
6. Panel wiring schematic
7. Accessory data
8. Installation & Operation Manuals

1.4. OPERATIONAL REQUIREMENTS AND WARRANTY

A. The contractor shall supply and install one (1) prefabricated and preassembled sewage pump station.

B. Each sewage pump station shall be completely issued with discharge connections, discharge pipes, guide bars, and cable holder for two (2) submersible grinder pumps.

C. Pumps shall be centrifugal submersible grinder pumps designed to reduce all material found in normal domestic and light industrial sewage, including plastics, rubber, sanitary napkins, and disposable diapers into a finely ground slurry. The resultant slurry is then pumped through small diameter piping into a gravity interceptor or treatment facility. The temperature limitation of the liquid being pumped is 104 degrees F continuous and shall be capable of running dry for extended periods.

1.5. MANUFACTURERS OR EQUAL

A. Crane Pumps and Systems – Barnes Pressure Systems

B. Or equal.

PART 2. PRODUCTS

2.1. PREFABRICATED SEWAGE LIFT STATION

A. Contractor shall furnish all labor, materials, equipment and performance of all work necessary or incidental to furnish and install a duplex prefabricated fiberglass reinforced polyester (FRP) Lift station. The lift station shall be completely factory-assembled unit, requiring minor adjustments and reassembly on site.

B. The Manufacturer shall demonstrate the ability to fabricate the various lift station components, as shown in the plans and as specified herein. The complete Lift Station shall be supplied by the pump vendor as a packaged unit including pumps & controls.

C. Wet well FRP wall laminate must be designed to withstand wall collapse or buckling based on these assumptions and Third-party specifications.

- Hydrostatic Pressure: 62.4 lbs. Per SQ Ft.
- Saturated soil weight: 120 lbs. Per Cubic Ft.
- Soil Modulus: 700 lbs. Per SQ Ft.
- Pipe Stiffness: As specified in ASTM D 3753

D. The wet well FRP laminate must be constructed to withstand or exceed two times the assumed loading on any depth of the wet well.

E. The exterior layer of body of laminate shall be of construction suitable for the service intended and contain sufficient glass by weight (50 TO 80 %) to provide the aggregate strength necessary to meet the tensile and flexural requirements. The exterior surface shall be relatively smooth with no exposed fibers or sharp projections. Hand work is acceptable, but enough resin shall be present to prevent fiber show.

F. The resin rich inner surface shall be free of cracks and crazing with smooth finish with an average of not more than two (2) pits per square foot, providing the pits are less than 0.125 in diameter and 0.3125 inches in depth and are covered with sufficient resin to avoid exposure of any fiberglass reinforcement materials. Some waviness shall be permissible as long as the surface is smooth. A minimum of 0.100 inch of the laminate next to the inner surface shall be reinforced with not less than 20 percent nor more than 30 percent by weight of non-continuous glass strands having fiber lengths from 0.5 to 2.0 inches. Both exterior and interior laminates shall have a Barcol Hardness of at least 90 percent of resin manufacture specified hardness for fully cured resin.

G. Must be constructed suitable for the service designated by the project engineer. Under total water submerged conditions. The center deflections of any basin bottom must be less than 3/8” as not to interfere with the pump mounting requirements and rail system. No bottom shall have a form of glue adhesive as attachment of the basin bottom.

H. The wet well top flange shall have an outside diameter at least 4 inches greater than the inside diameter of the basin. A (6) six-hole pattern shall accommodate the mounting of a cover with at least 3/8 inches in diameter 300 series stainless steel fasteners. Non –corroding stainless steel threaded inserts shall be fully encapsulated with non-continuous mat or chop strand glass fiber reinforcement, the inserts shall have an offset tab to prevent stripping or spinning out when removing and reinserting cover fasteners.

I. The cover shall be constructed of $^{1}/_{4}$-inch-thick steel diamond plate material with 300 series stainless steel hardware. The hatch shall have a positive means of holding door open in the vertical position (locking hold open arm) made of non-corrosive material. The cover shall be mounted with a minimum of six 300 series stainless steel fasteners. The access hatch cover shall have a lift handle and a means of locking.

J. The hatch cover shall be coated with a light color for reflection and reduced heat (white or safety yellow will be acceptable colors). Prepare steel surfaces by sandblasting to meet SSPC-SPC Commercial Blast. Prime coat shall be epoxy. Intermediate coat with urethane and sprinkle 20/40 grit or equivalent angular material for anti-skid. Top coat shall be urethane.

K. Designated size NPT 300 series stainless coupling, full welded in the center of a 300 series stainless steel plate. Mounted with 300 series stainless steel hardware. 1 $^{1}/_{4}$ inch thru 4 inch. Wet well penetrations to be sealed prior to mounting of coupling.

L. The Cast Iron Caulking Hubs are made of cast iron conforming to radius of fiberglass basin. All fasteners to be 300 series stainless steel. Use local plumbing codes for approved sealing methods and materials.

M. Float bracket shall be fabricated from 300 series stainless steel with compression style cord grips to maintain float level position. Install with 300 series stainless steel hardware.

N. Wet well ventilation shall comply with all applicable codes.

O. Handling instructions shall be provided by lift station manufacture with lift station to ensure proper handling of the lift station. After inspection upon delivery by receiver, the contractor shall store any loose items and account for them in a clean and dry environment. All equipment needed to offload and install lift station shall be determined and be provided by contractor on the project.

P. The prefabricated FRP lift station manufacture shall guarantee the prefabricated lift station as approved drawings for a period of two (2) years from the date of delivery.

2.2. SUBMERSIBLE GRINDER PUMPS (BARNES)

A. Each station shall be equipped with two (2) submersible grinder pumps.

B. Each pump shall be designed to meet the following conditions:

	Flow in US GPM (Minimum)	**TDH**	**Voltage**	**Horsepower (Maximum)**
Grinder Pump	25 GPM	30 ft.	208 volt 3-Phase 60 Hz	2 HP

C. The hydraulic of the pump shall be capable of handling raw domestic wastewater and storm water with fibrous materials**.**

D. The design shall be such that pumping units will be automatically connected to the discharge piping when lowered into place on the discharge connection. The pumps shall be easily removable for inspection or service, requiring no bolts, nuts, or other fastenings to be removed for this purpose, and no need for personnel to enter the wet well.

E. The impeller blades shall be self-cleaning upon each rotation as they pass across a sharp relief groove in the Insert ring and shall keep the impeller blades clear of debris. The pump inlet shall have a guide pin which moves fibers from the center of the impeller to the leading edges of the impeller. The impeller shall move axially upwards to allow larger debris to pass through and immediately return to normal operating position. The clearance between the insert ring and the impeller leading edges shall be adjustable.

F. Unit (s) shall be CSA listed for Class I, Groups C & D, Division 1, hazardous locations. The volute, seal plates and motor housing shall be constructed of high-quality ASTM A-48 class 30 cast iron. [The pump (s) shall be painted with amide amine modified polymer satin gloss epoxy with 10 mil minimum thickness]. All exposed hardware shall be 300 series stainless steel. All surfaces coming into contact with sewage, other than stainless steel, shall be protected by an approved sewage-resistant coating. Discharge connection shall be a standard 2-inch NPT in the vertical position or 2/2.50/3 inch 125 pound slotted flanged to accommodate ANSI or ISO piping flange.

G. The pump impeller shall be of the recessed vortex design. Pumps with standard centrifugal semi-open impeller designs shall not be acceptable. The impeller shall be of ASTM A-48 class 30 cast iron construction and machined for threading to the motor shaft.

H. The grinder mechanism shall consist of a radial cutter threaded and locked on the motor shaft by a washer in conjunction with a countersunk flat head cap screw, and a shredding ring containing a minimum of fifteen flow passages with cutting edges. The shredding ring shall be reversible to provide twice the cutting-edge life. Both the shredding ring and radial cutter shall be constructed of 440C stainless steel hardened to a min. Rockwell C55 and shall be finish ground for a fine cutting edge. Two-stage cutter mechanisms requiring external adjustment for proper clearance are not acceptable.

I. The unit shall utilize a tandem mechanical shaft seal arrangement and shall operate in an oil atmosphere. The materials of construction shall be carbon for the rotating face and ceramic for the stationary face, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware, and all elastomer parts to be Buna-N. The seal shall be commercially available and not a proprietary design of the manufacturer.

J. The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability.

K. The motor shall be constructed with the windings operating in a sealed environment containing clean dielectric oil, making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat being generated.

L. Air-filled motors shall not be acceptable. The motor windings shall be spike resistant with Class F insulation and Class H wire. The motor shall meet the standard NEMA design L for single phase, NEMA design B for three phase and be inverter duty rated per NEMA MG1 Part 31. The motor shaft shall be of 416 stainless steel. Protection against excessive temperature shall be provided by heat sensor thermostat attached to the stator windings and connected in series with the contactor coil in the control panel.

M. The lower bearing shall be of the double row ball type to accept radial and thrust loads, and the upper bearing of the single row ball type for radial loads. Bearings shall operate in an oil bath atmosphere for superior life.

N. The pump shall be equipped with 50 ft. of a CSA-qualified submersible plug-n-play quick connect power cable constructed in accordance with type W guidelines and shall include the moisture and temperature sensor leads. The cable entry system shall consist of an expanding rubber plug held in place by a cast stainless steel plate indicating voltage and max amps.

O. The pump manufacturer shall perform the following inspections and tests:

   a. A check of the motor voltage and frequency shall be made as shown on the name plate.

   b. A motor and cable insulation test for moisture content or insulation defects shall be made per UL/ CSA criteria.

   c. The pump shall be completely submerged and run to determine that the unit meets three pre-determined hydraulic performance points.

P. Each pump shall be fitted with a minimum of 15 feet of stainless-steel lifting chain. The working load of the lifting system shall be 50% greater than the pump unit weight.

Q. The pumps shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pumps.

R. Pump removal system shall be non-sparking.

2.3 PUMP CONTROL SYSTEM FOR DUPLEX GRINDER PUMP STATION

A. A duplex grinder pump control panel shall be supplied. Control panel shall be as a packaged unit provided in tandem with prefabricated basin and pumps as outlined in this document . Control panel to be mounted where indicated in Drawings, inside adjacent building. Appropriate length of wire and conduit to be provided for all items.

B. Operating voltage: 3-phase, 208 volts, 60Hz

C. Duplex pump control components shall include:

1. Type 4 / 12, Painted Steel enclosure, Wall / Rack Mounted, w/ 3 Point Latch

   a. Inner Dead-Front Door (* Denotes Items Mounted on Inner Door)

   b. 12" LED Service Light

2. Main Circuit Breaker w/ Extended Rotary Handle *
3. Circuit Breakers For Each Pump
4. NEMA Contactor w / Electronic Overload Relay For Each Pump
5. Overload Reset Pushbutton *
6. Surge Arrestor
7. 100W Strip Heater, Adjustable Thermostat
8. GFCI, 15A, Circuit Breaker Protection *
9. Hand-Off-Auto Switch (30mm) For Each Pump *
10. Pump Run Pilot Light (30mm, Green) For Each Pump *
11. Pump Tripped Pilot Light (30mm, Red) For Each Pump *
12. Pump Run Pilot Light (30mm, Green) For Each Pump *
13. Elapsed Time Meter For Each Pump (Analog) + Simultaneous Run *
14. Alarm Light (40W), Red
15. Alarm Horn w/ Silence Pushbutton, 120VAC
16. Battery Backup (Audible & Visual, Flasher)
17. V350 Based Duplex Controller
18. Terminal Blocks As Required
19. Control Relays As Required
20. Space for Customer Equipment (12"H x 12"W)
21. Wires Labeled
22. Engraved Labels

D. The following features and components shall be mandatory at a minimum:

1. UL 508A Listed
2. NEMA 4X Non-metallic Enclosure
3. Padlockable Latch
4. Pump/Panel Circuit Breaker
5. IEC Rated Motor Contactor
6. Ambient Compensated Current Overload
7. Pump Start Pushbutton
8. Individually Fused Circuits for Alarm and Control Components
9. 25-Watt High Water Alarm Light with NEMA 4X Lens
10. Terminal Strip and Ground Lug for Incoming Connections

11. Pump Alternator
12. Intrinsic Barriers
13. 90 db alarm horn with NEMA 4X silence pushbutton & Alarm Light Indicator
14. Elapsed Time Meter
15. Seal Leak Detection
16. Operating Controls

E. Level Control

1. Each station shall be equipped with 4 Float switches for level control.
2. Material of casing: Polypropylene.
3. Degree of protection: NEMA 6.
4. They shall be applicable for liquids with a density of 0.95 – 1.10 g/cm3. The Level control shall include 40 feet submersible cable.

F. Remote Cellular Dialer

1. Lift Station Controls System shall include a separately mounted remote cellular dialer.
2. Dialer shall include separate enclosure, remote telemetry unit, modem, power supply and antennas as required for remote communication of alarms.

G. Controls

1. Controls for the grinder station shall be supplied by the station manufacturer and shall be the manufacturer's standard controls as outlined in the following paragraphs.
2. Typical operation shall alternate which pump is called for when the pump-on level is reached.
3. Pumps shall lock-out when the low-level is reached.
4. The Alarm/Disconnect Panel shall include the following features: auto and visual alarm, push-to-run, and high level (redundant) pump starting control. The alarm sequence is to be as follows:
    a. When the liquid level in the sewage wet-well rises above the alarm high-level or falls below the alarm low-level, visual and audio alarms will be activated. The contacts on the alarm pressure switch will close. The redundant pump starting system will be energized.
    b. The audio alarm may be silenced by means of the externally mounted, push-to-silence button.
    c. Visual alarm remains illuminated until the sewage level in the wet well drops below the "off" setting of the alarm pressure switch.
5. The visual alarm lamp shall be inside a red fluted lens at least 2 5/8" in diameter and 1 11/16" in height. A visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 3R rating. For duplex units, in addition to the above, two high-level indicator lights shall be mounted behind the access cover. During a high-level alarm condition, the appropriate light will illuminate to indicate which pump core requires servicing.
    a. The audio alarm shall be printed circuit board in conjunction with a minimum 86 dB buzzer with a quick mounting terminal strip mounted in the interior of the enclosure. The audio alarm shall be capable of being de-activated by depressing a push-type switch which is encapsulated in a weatherproof silicone boot and mounted on the bottom of the enclosure.
    b. The entire Alarm/Disconnect Panel manufactured shall be listed by Underwriters Laboratories, Inc.

2.4 OHSA CONFINED SPACE

A. All maintenance tasks for the grinder pump station must be possible without entering the grinder pump station.

2.5 CORROSION PROTECTION

A. All materials exposed to wastewater shall have inherent corrosion protection i.e., epoxy powder coat, cast iron, fiberglass, stainless steel, and PVC.

2.6 SAFETY

A. The Grinder Pump shall be free from electrical and fire hazards as required in a residential environment. As evidence of compliance with this requirement, the completely assembled and wired Grinder Pump Station in its tank shall be listed by Underwriters Laboratories, Inc., to be safe and appropriate for the intended use.

B. The Grinder Pump shall meet accepted standards for plumbing equipment for use in or near residences, shall be free from noise, odor, or health hazards, and shall have been tested by an independent laboratory to certify its capability to perform as specified in either individual or low-pressure sewer system applications. As evidence of compliance with this requirement, the grinder pump shall bear the National Sanitation Foundation seal.

2.7 SERVICEABILITY

A. The grinder pump station shall have two lifting hooks complete with a nylon lift-out harness connected to its top housing to facilitate easy pump removal when necessary.

PART 3. EXECUTION

3.1. GENERAL

A. Perform installation in accordance with Contract Documents and manufacturers specifications.

3.2. BACKFILL REQUIREMENTS

A. Proper backfill is essential to the long-term reliability of any underground structure. Several methods of backfill are available to produce favorable results with different native soil conditions. The most highly recommended method of backfilling is to surround the unit to grade using Class I or Class II backfill material as defined in ASTM 2321. Class IA and Class IB are recommended where frost heave is a concern, Class IB is a better choice when the native soil is sand or if a high, fluctuating water table is expected. Class I angular crushed stone offers an added benefit in that it doesn't need to be compacted. Class II, naturally rounded stone, may require more compactive effort, or tamping, to achieve the proper density. If the native soil condition consists of clean compactable soil, with less than 12% fines, free of ice, rocks, roots, and organic material, it may be an acceptable backfill. The soil must be compacted in a lift not to exceed one foot to reach a final Proctor Density of between 85% and 90%. Heavy, non-compactable clays and soils are <u>not</u> suitable backfill for this or any underground structure such as inlet or discharge lines. If you are unsure of the consistency of the native soil it is recommended that a geotechnical evaluation of the material is obtained before specifying backfill. Another option is the use of flowable fill (i.e. low slump concrete). This is particularly attractive when installing grinder pump stations in augured holes where tight clearances make it difficult to ensure proper backfilling and compaction with dry materials. Flowable fills should not be dropped more than four feet from the discharge to the bottom of the hole to avoid the separation of the constituent materials.

B. Backfill of clean native earth, free of rocks, roots, and foreign objects shall be thoroughly compacted in the lift not exceeding 12" to a final Proctor Density of not less than 85%. Improper backfilling may result in damaged accessways.

C. All restoration will be the responsibility of the Contractor. The properties shall be restored to their original condition in all respects, including, but not limited to, curb and sidewalk replacement, landscaping, loaming and seeding, and restoration of the traveled ways, as directed by the Engineer.

3.3. EXAMINATION

A. A factory trained technician shall examine the work area prior to beginning work and check the following:

1. The environment is safe to begin working in
2. All surfaces are ready to receive work
3. All tools are in the proper location and are in good condition
4. Grounding of the system

3.4. FACTORY TRAINED SUPERVISION

A. The manufacturer shall provide the services of a qualified factory-trained technician(s) who shall inspect the placement and wiring of each station, perform field tests as specified herein, and instruct the Owner's personnel in the operation and maintenance of the equipment before the stations are accepted by the Owner.

B. All equipment and materials necessary to perform testing shall be the responsibility of the Installing Contractor. This will include, as a minimum, a portable generator (if temporary power is required) and water in each basin.

C. Functional tests of all equipment, alarms, and controls shall be performed.

D. After installation, a pump station start-up shall be performed by the installing contractor under the supervision of the manufacture's authorized representative. 8 hours of field service shall be provided by an authorized, factory trained representative of the pump manufacturer. Services shall include, but not be limited to, inspection of the completed pump station installation to ensure that it has been performed in accordance with the manufacturer's instructions and recommendations, supervision of all field-testing and activation of the Pump Manufacturer's Warranty. The test shall demonstrate to the satisfaction of the Owner that the equipment meets all specified performance criteria, is properly installed and anchored, and operates smoothly without exceeding the full load amperage rating of the motor. The Contractor shall be responsible for coordinating the required field services with the Pump Manufacturer.

3.5. CERTIFICATION OF TESTING

A. All tests shall be performed in the presence of a duly authorized representative of the Owner. If the presence is waived, certified results shall be provided by the Contractor.

B. Written notice of all tests shall be given two weeks in advance.

3.6. TEST EQUIPMENT

A. All test equipment shall be provided by the Contractor.

3.7. CONTROLS PROGRAMMING

A. Controls for the grinder station shall be supplied by the station manufacturer.

B. Contractor shall coordinate pump controls with manufacture and engineer in the field.

SECTION 33 46 10
SUBDRAINAGE FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building Perimeter, Retaining Wall, and Under-Slab Drainage Systems.

1.02 RELATED REQUIREMENTS

A. Section 31 23 16 - EXCAVATION FOR SPRAY GROUNDS: Excavating for subdrainage system piping and surrounding filter aggregate.

B. Section 31 23 23 - Fill and Backfill: Backfilling over underdrain aggregate, up to subgrade elevation.

1.03 REFERENCE STANDARDS

A. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2009.

B. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2008.

C. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2004.

D. ASTM F 949 - Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings; 1993.

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 PIPE MATERIALS

A. Polyvinyl Chloride Pipe: ASTM F 949; 4 inch diameter; with required fittings.

1. Features:
   a. Pipe Stiffness: 46 psi.
   b. Smooth interior.
   c. Double wall design.
   d. Positive gasketed jointing system.
2. Perforation Dimensions:
   a. Slot Dimension (inches): 1.062L by 0.031W.
   b. Centers: 0.42 inches.
   c. Perforation Open Area: 1.90 square inches per linear foot.

B. Use perforated pipe at subdrainage system; unperforated through sleeved walls and where not under pervious fill.

2.02 AGGREGATE

A. Underdrain Aggregate Material: As specified in Section 31 23 23.

2.03 ACCESSORIES

A. Pipe Couplings: Solid PVC.

B. Filter Fabric: Provide _____ manufactured by _____ .

1. Manufacturers and products:
   a. Contech C60NW.
   b. Propex Geotex 601.
   c. Mirafi 160N.
2. Properties:
   a. Tensile Strength (Grab), ASTM D 4632: 160 lbs.
   b. Apparent Opening Size, ASTM D 4751: 70 US Standard Sieve.
   c. Water Flow Rate, ASTM D 4491: 110 gpm/sq. ft.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

3.02 PREPARATION

A. Hand trim excavations to required elevations. Correct over-excavation with structural fill.

B. Remove large stones or other hard matter that could damage drainage piping or impede consistent backfilling or compaction.

3.03 INSTALLATION

A. Place filter fabric on compacted impervious fill prior to installation of pipe. Allow adequate material to allow for required overlap over top of pipe.

B. Install and join pipe and pipe fittings in accordance with pipe manufacturer's instructions.

C. Install 4 inches of underdrain aggregate over fabric unless shown otherwise on the drawings.

D. Place drainage pipe on underdrain aggregate.

E. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

F. When pipe elevations are shown on the Drawings, the pipe shall uniformly slope between the given elevations. If Contractor believes additional change in direction fittings are required in order to achieve the slopes shown, then Contractor shall notify Engineer prior to installation.

G. Place pipe with perforations facing down. Mechanically join pipe ends.

H. Install pipe couplings and fittings.

I. Install underdrain aggregate at sidescovers and top of pipe. Provide underdrain aggregate top cover compacted thickness of 4 inches unless shown otherwise on the drawings.

J. Place filter fabric over levelled top surface of underdrain aggregate cover prior to subsequent backfilling operations.

K. Place underdrain aggregate in maximum 4 inch lifts, consolidating each lift.

L. Refer to Section 31 23 23 for compaction requirements. Do not displace or damage pipe when compacting.

M. Place fill materials indicated on drawings over underdrain assembly and compact.

3.04 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspection and testing.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

3.05 PROTECTION

A. Protect pipe, filter fabric, and aggregate cover from damage or displacement until backfilling operation begins.

END OF SPEC SECTION 334610

SECTION 33 49 10

WET PIT AND BACKWASH PIT FOR SPRAY GROUNDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Precast Wet Pit and Backwash Pit for spray ground.

1.02 RELATED SECTIONS

A. Section 31 23 23 - Fill and Backfill.

1.03 REFERENCES

A. ASTM A 48 - Standard Specifications for Gray Iron Castings; 1994.

B. ASTM A 615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2000.

C. ASTM C 361 - Standard Specification for Reinforced Concrete Low-Head Pressure Pipe; 1999.

D. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections; 1997.

E. ASTM C 497 - Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile; 1998.

F. ASTM C 990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants; 2000.

G. ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness; 2000.

H. ASTM D 4101 - Standard Specification for Propylene Plastic Injection and Extrusion Materials; 1999.

1.04 SUBMITTALS

A. See Administrative Requirements, for submittal procedures.

B. Drawings and data covering precast concrete sections and castings.

C. Data submitted for steel-reinforced plastic manhole steps shall include verification of the type and grade of steel used for reinforcement, typical chemical analysis of the steel, type and classification of the plastic, and reports of acceptance tests performed in accordance with ASTM C 478, Section 12.6, and C 497, Section 10.

D. Product Data: Provide manhole covers, component construction, features, configuration, and dimensions.

E. Shop Drawings: Indicate manhole locations and elevations and pipe sizes and elevations of penetrations.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Precast concrete sections shall not be delivered to the job until representative concrete control cylinders have attained a strength of at least 80 percent of the specified minimum.

B. Precast concrete sections shall be handled carefully and shall not be bumped or dropped. Hooks shall not be permitted to come in contact with joint surfaces.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Barbour Concrete Company; Tel: (816) 796-3344; Fax: (816) 796-3518.

2.02 MATERIALS

A. Cast-in-Place Concrete: Materials, handling, forms, finishing, curing, and other work as specified in Section 03 03 05.

B. Structures must be designed by Professional Engineer licensed in the State where the product is installed.

C. Precast Wet Pit and Backwash Pit for spray ground:

1. Precast structure with base and sections. Rectangular dimensions as shown on the drawings. Designed to resist hydrostatic uplift.
2. Minimum Wall Thickness: 1/12 of inside diameter, plus 1 inch.
3. Reinforcement: ASTM C 478.
4. Precast wet pit shall use 1.5” cone ties and grouted flush. Surface strap ties not allowed due to rusting.

D. Nonshrinking Grout:

1. Manufacturers:
   a. Grace "Supreme".
   b. L&M "Crystex".
   c. Master Builders "Masterflow 713 Grout" or "Set Grout".
   d. Five Star Products "Five Star Grout".

E. Resilient Manhole/Pipe Connectors:

F. Mastic Fill: Butyl rubber compatible with resilient connector material.

G. Gaskets:

1. Mastic:
   a. Manufacturers:
      1) Hamilton-Kent "Kent-Seal No. 2".
      2) Sheller-Globe "Tac-Tite".
      3) K.T. Snyder "Ram-Nek".

b. Gaskets shall meet the requirements of ASTM C 990.

c. Cross-sectional area as recommended by manhole manufacturer.

2. Rubber:

a. ASTM C 361, Section 6.9.1, except gasket shall be synthetic, with hardness of 40 plus or minus 5 when measured by ASTM D 2240, Type A durometer.

b. Natural rubber will not be acceptable.

H. Castings: ASTM A 48, Class 35B or better.

1. Manhole Ring and Cover For Backwash Pit

a. Manufacturer:

1) Deeter Foundry, Inc.: Model 1031 Manhole Ring and Solid Cover, Tel: (800) 234-7466; Fax: (402) 464-8533.

2) Acceptable manufacturers:

(a) Neenah: www.GroupNEI.com

(b) US Foundry: www.USFoundry.com

b. Application: For Backwash Pit

c. The cast iron lid is to be painted.

d. Materials:

1) Gray iron with minimum tensile strength of 35,000 psi (ASTM A-48-83, Class 35B for gray iron).

2) Rated heavy duty for highway and street traffic. Suitable of H-20 load requirements of 16,000 lbs.

3) Ring height of 7 inches.

4) Opening size of 24 inches.

I. Aluminum access hatch for Wet Pit.

J. Manhole Steps:

1. Manufacturers:

a. H. Bowen "BOWCO No. 93813".

b. M.A. Industries "PS2-PF".

c. Lane International: www.LaneInternational.com

2. Steel-reinforced plastic; 1/2 inch deformed steel bar, ASTM A 615, Grade 60 minimum, totally encapsulated in copolymer polypropylene, ASTM D 4101.

2.03 MANUFACTURE

A. The first riser sections for use with cast-in-place bases shall be provided with horseshoe-shaped boxouts for connecting piping to be grouted in, or with circular openings with

continuous, circular, resilient connectors cast into the riser wall. Boxouts for grouting, if used, shall have surfaces grooved or roughened to improve grout bond.

B. Precast base sections shall be provided with circular openings, with continuous, circular, resilient connectors cast into the wall.

C. Resilient connectors shall be installed in accordance with the manufacturer's recommendations, except that connectors shall be positioned so that sealing or resealing operations may be accomplished from inside the manhole.

D. Precast sections may be provided with lifting notches on the inside faces of walls to facilitate handling. Lifting notches shall be not more than 3 inches deep; holes extending through the wall will not be acceptable.

E. If precast concrete base sections are used, part of the concrete invert fill may be furnished with the precast unit; however, a rough surface shall be provided to improve bond with the final invert fill. At least the top 2 inches of the concrete invert fill shall be installed in the field.

PART 3 EXECUTION

3.01 EXAMINATION

A. Precast concrete sections shall be inspected when delivered and all cracked or otherwise visibly defective units shall be rejected.

3.02 CONSTRUCTION

A. Tops:

1. At the option of the Contractor, standard manholes may be constructed with cast-in-place concrete tops or precast concrete (developed) tops.
2. If lifting notches are provided to facilitate handling, the lifting notches shall be filled with non-shrink grout as specified in Section 13 11 15.

B. Bases:

1. At the option of the Contractor, standard manholes may be constructed with cast-in-place concrete bases or precast concrete (developed) bases.
   a. If cast-in-place concrete bases are used, concrete shall be placed on undisturbed earth, unless shown otherwise, in accordance with applicable requirements of the Section 13 11 15.
      1) When resilient connectors are used with cast-in-place bases, the concrete fill under the connecting pipe outside the manhole shall be deleted and shall be replaced with granular embedment material to undisturbed earth.
   b. If precast concrete (developed) bases are used, the subgrade materials shall be excavated to undisturbed earth and to a uniform elevation which will permit at least 4 inches of granular embedment material, as specified in Section 31 23 23, to be installed and compacted. The surface of the granular material shall be carefully graded and the base section accurately set so that connecting pipes will be on proper

line and grade. The elevation of the granular material shall be adjusted as required until proper grade and alignment of the base section has been attained.

1) No wedging or blocking under precast concrete bases will be permitted.

2. In no case shall the invert section through a manhole be greater than that of the outgoing pipe. The shape of the invert shall conform exactly to the lower half of the pipe it connects. Side branches shall be connected with a radius of curve as large as practicable. All inverts shall be troweled to a smooth, clean surface.

C. Riser and Cone Sections:

1. Circular precast sections shall be provided with a rubber or mastic gasket to seal joints between sections. Mastic gaskets shall be used only at temperatures recommended by the manufacturer. Lifting notches in manhole walls shall be filled with nonshrinking grout.
2. Manhole steps shall be plant-installed and shall be driven into prepared holes or vibrated into green concrete, in accordance with the recommendations of the step manufacturer.

D. Connecting Piping:

1. The space between connecting pipes and the wall of precast sections shall be completely filled with nonshrinking grout, except where resilient connectors are provided.
2. When resilient connectors are used, the connecting pipe shall be carefully adjusted to proper line and grade, and the bedding material shall be compacted under the haunches and to the spring line of the pipe for a distance of at least 6 feet from the manhole wall and to at least the minimum trench width. The pipe shall be installed in the resilient connector prior to backfilling outside the manhole and shall be resealed as required after completion of the manhole and backfill. All visible leakage shall be eliminated.
3. The connecting pipe for installation with resilient connectors shall be plain-end, square cut spigots and shall not protrude more than 1 inch inside the manhole wall. A clear distance of at least 1 inch from the end of each connecting pipe and around the pipe shall be provided when the concrete invert fill is installed. After completion of the manhole, the boxout shall be filled with mastic filler material, completely filling the space beneath the pipe and extending to at least the spring line. The filler material shall provide a smooth, uniform surface between the inside diameter of the pipe and the manhole invert.

END OF SPEC SECTION 334910

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SECTION 260500
COMMON WORK RESULTS

PART 1 - GENERAL

1.1 SCOPE

A. The work under this section includes basic electrical requirements, which are applicable to all Division 26, 27 and 28 sections.

B. Overview of Work

1. Demolition/Relocation/Modification

2. Power Distribution

3. Branch Power

4. Equipment Connections

5. Lighting and Lighting Controls

C. In these documents, “Contractor” refers to the Electrical Contractor and all their subcontractors, unless listed otherwise. The division of Work with the electrical scope is the responsibility of the General Contractor.

D. The Contractor is responsible for providing and installing fully functional systems.

E. If the Work is shown on the drawings or noted in the specifications, it shall be included by the Contractor.

F. If equipment is provided by the Contractor, it shall be installed by the Contractor, unless noted otherwise.

G. Drawings are necessarily diagrammatic by their nature and are not intended to show every connection in detail or every conduit in its exact location. Carefully investigate structural and finish conditions and coordinate the separate trades in order to avoid interference between the various phases of Work. Organize and lay out Work so that it will be concealed in furred chases and suspended ceilings, etc., in finished portions of the building, unless specifically noted to be exposed. Install all Work parallel or perpendicular to building lines unless otherwise noted.

H. The intent of the Drawings is to establish the types of systems and functions; not to set forth each item essential to the functioning of the system. Install the Work complete, including minor details necessary to perform the function indicated. Review pertinent Drawings and adjust the Work to conditions shown. Where discrepancies occur between Drawings, Specifications, and actual field conditions, immediately notify the Architect and Engineer for interpretations.

I. All sizes as given are minimum except as noted.

J. All materials shall be new (unless noted or stated otherwise) and free of defect.

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K. All work shall be subject to the Architect's, Engineer's, and Owner's observations from the commencement of work until the acceptance of the completed work.

1.2 RELATED WORK

A. Applicable provisions of Division 0 and Division 1 govern work under this Section.

1.3 REFERENCES

A. All work shall conform to the most current version of all applicable codes and standards or the version adopted by the jurisdiction.

B. Codes

1. International Building Code

2. International Fire Protection Code

3. International Energy Conservation Code

4. NFPA – National Fire Protection Association

   a. NFPA 70 (National Electric Code)
   b. NFPA 72 (National Fire Alarm and Signaling Code)
   c. NFPA 101 (Life Safety Code)

5. State or City Codes for the City of Marshalltown.

C. Standards

1. ANSI

D. Governing Bodies

1. Owner's Insurance Company

2. State Fire Marshall

3. AHJ – Authority Having Jurisdiction

4. UL - Underwriters Laboratories

1.4 SUBMITTALS

A. The review of Shop Drawings by the Engineer is for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the Plans and Specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. The Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means,

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methods, techniques, sequences and procedures of construction; coordination with the Work of all trades; and for performing all work in a safe and satisfactory manner.

B. Refer to individual technical Specification sections for specific submittal requirements.

C. Submission of Shop Drawings electronically in .PDF format is required.

D. If hard copies of shop drawings are required for this project, coordinate the quantity with the Architect and General Contractor. Provide one (1) copy for the Engineer's records.

E. The Engineer will review one (1) resubmittal for each product. If additional resubmittals are required, the Contractor shall be responsible to bear the cost for the Engineer to recheck and handle the additional shop drawing submittals. Documents will not be reviewed until payment is agreed upon.

F. Contractor may request electronic files from the Engineer if needed to complete their Shop Drawings. An Electronic File Request Form will be sent to the contractor if files are requested and must be completed and signed before the AutoCAD files are released to the Contractor.

G. All submittals for equipment and materials shall be reviewed and approved by the Engineer prior to the fabrication or release by the contractor. This includes the coordination of equipment between trades. The release, purchase, installation or fabrication of any items prior to the contractor receiving an approved shop drawing will be at the contractor's own risk. Any rework that results will be provided by the contractor at no cost to the Owner or design team.

H. Submittals must be reviewed and approved by the Contractor before submitting to the Engineer.

I. Submittals shall be grouped to include complete submittals of related systems, products, and accessories in a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams of electrically powered equipment.

1.5 ELECTRONIC DOCUMENT RELEASE

A. Electronic versions of the bid documents will be made available to the contractors for use during the bidding process and to help generate fabrication drawings for various systems. A summary of the requirements for the various document types is listed below:

1. PDF

   a. Contact the Construction Manager or Architect to obtain a PDF version of the Bid Documents. No Document Release Form is required.

2. REVIT

   a. The REVIT drawings will be converted to AutoCAD and then transferred to the contractor.
   b. Bluestone Engineering can provide an AutoCAD version of the bid documents for the contractor to use for generating shop drawings and fabrication drawings. This will include plan drawings with the architectural background. The contractor is responsible for incorporating any modifications that occur during bidding by all disciplines. Details and schedules will not be included.
   c. A document release form (see attached) will be required to be completed by the contractor to determine the version of AutoCad and drawings required.

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d. Submittal of the document release form fee will be required prior to the AutoCAD files being transmitted.

1.6 SUBSTITUTIONS

A. All manufacturers listed as Acceptable Manufacturers in each specification section are considered equal to the basis of design. The basis of design is preferred and will take precedence. Any products from an alternate approved manufacturer need to meet the requirements and performance specified and shall be equal to the basis of design.

B. The Contractor may request permission for a substitution of any item (equipment or material), subject to the following conditions:

1. Submit substitution requests in writing to the Engineer, on a form supplied by the Engineer. A sample copy of this form is included at the end of this section. An electronic copy can also be provided to the Contractor by the Engineer.

2. Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contractor documents, the Contractor is responsible for all costs involved in integrating the equipment or accessories into the system and the assigned space and for obtaining the performance from the system into which these items are placed as well as any re-design costs incurred by the Architect or Engineer. The Contractor is also responsible for coordinating changes required by other trades.

3. Any requests for alternate manufacturers must be submitted to the Architect/Engineer at least ten (10) days prior to bid day. Incomplete substitution requests will not be considered.

C. Approval

1. No work involving requests for substitution shall commence without written approval on the provided form by the Engineer.

2. Any work started or material ordered/installed by the Contractor without written approval shall be removed/repaired at the sole expense of the contractor. The Contractor will also be responsible for any costs incurred by the Owner for such rework.

1.7 QUALITY ASSURANCE

A. Warranty

1. Equipment warranty shall be a minimum of one (1) year from date of factory supervised startup or from the date of substantial completion, whichever is later.

2. Contractor shall warranty all of their work for one (1) year from the date of substantial completion

B. These documents are diagrammatical in nature and intended to convey scope and general arrangement of the electrical and technology systems. Not all conduits, junction boxes, accessories, etc. are shown on Plan. If items are required to make a system fully operational but not shown on Plan or in these Specifications, they shall be included by the Contractor.

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C. The intent of the Drawings is to establish the types of systems and functions; not to set forth each item essential to the functioning of the system. Install the Work complete, including minor details necessary to perform the function indicated. Review pertinent Drawings and adjust the Work to conditions shown. Where discrepancies occur between Drawings, Specifications, and actual field conditions, immediately notify the Architect and Engineer for interpretations.

D. It is the contractor's responsibility to determine all utility routing prior to purchase and installation of material.

E. For remodel or addition projects, the contractor shall visit and survey the site prior to submitting a bid. The contractor shall visit the site to understand the complexity of utility routing, phasing, staging, and all general installation. Submitting a bid means the contractor acknowledges the complexities of the project and has made provisions for overcoming these complexities in their bid.

F. The Contractor shall report any discrepancies between these documents and site conditions immediately to the Engineer prior to submitting a bid or starting work. Submittal of a bid indicates that the contractor and the contractor's subcontractors have carefully and thoroughly reviewed the Drawings, Specifications, and other construction documents and have found them complete and free from ambiguities and sufficient for the purposes intended.

G. Install all equipment per the manufacturer's requirements / recommendations.

H. No equipment provided or installed shall contain mercury.

I. All equipment shall be UL listed where applicable.

1.8 REGULATORY AND UTILITY REQUIREMENTS

A. Contractor is responsible for coordinating all required site inspections by authorities having jurisdiction. Contractor shall notify General Contractor of all scheduled inspections seven (7) working days prior to site visit.

B. Contractor is responsible for paying for all fees, permits, and inspections that are required to complete their work.

C. Contractor shall include all work required to install new utilities and meters as shown on drawings.

1.9 PROTECTION OF FINISHED SURFACES

A. Furnish one (1) can of touch-up paint for each different color factory finish for equipment furnished by the Contractor. Deliver touch-up paint with other "loose and detachable parts" as covered in the General Requirements.

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1.10 SEALING AND FIRESTOPPING

A. Sealing and firestopping of sleeves/openings between conduits, troughs, etc. and the structural or partition opening shall be the responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals skilled in such work to do the sealing and firestopping. These individuals hired shall normally and routinely be employed in the sealing and fireproofing occupation.

1.11 WORK BY OWNER AND/OR OWNER AGENCY

A. Electrical testing not described in these contract documents will be by the Owner under separate contract(s).

1.12 OMISSIONS

A. No later than ten (10) days before bid opening, the Contractor shall call the attention of the Architect and Engineer to any materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

1.13 DELIVERY, STORAGE, AND HANDLING

A. All equipment and materials shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.

B. Store equipment indoors in clean dry space with uniform temperature to prevent condensation. Equipment shall include but not be limited to panelboards, transformers, motor controllers, enclosures, controllers, circuit protective devices, cables, wire, light fixtures, electronic equipment, and accessories.

C. During installation, equipment shall be protected against entry of foreign matter; and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.

D. Take such precautions as are necessary to protect apparatus and materials from damage. Damaged equipment shall be, as determined by the Owner and/or Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.

E. Protect factory finish from damage during construction operations until acceptance of the Project. Restore any finishes that become stained or damaged to Owner's satisfaction.

1.14 DIVISION OF WORK AND COORDINATION

A. The Electrical Contractor is responsible for providing and installing power wiring up to equipment provided by others for a single point connection. Internal wiring of equipment provided by others shall be the responsibility of the manufacturer or the contractor responsible for providing and installing the equipment.

B. Controls, disconnect switches, starters, variable frequency drives, etc. shall be provided and installed by the contractor noted on the plans and in the specifications. It is the responsibility of

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the Contractor to request written clarification for any ambiguity regarding division of work and coordination at least ten (10) days prior to bid.

C. Utilities routed within the building shall be installed in an orderly manner. All work will be coordinated with other disciplines prior to installation. The following list ranks the priority of the utilities to be installed:

1. Light fixtures

2. Gravity piping

3. Ductwork

4. All other piping

5. Electrical conduits

D. Any installed work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.

E. Arrange for conduit and raceway spaces, chases, slots, and openings in building structure during progress of construction, to allow for electrical installations.

F. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

G. Coordinate requirements for access panels and doors for electrical items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

1.15 SALVAGE MATERIALS

A. No materials removed from this project shall be reused. All materials removed shall become the property of, and shall be disposed of by, the Contractor except for items the Owner has designated they will keep.

1.16 OPERATION AND MAINTENANCE DATA

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

B. In addition to the general content specified under GENERAL REQUIREMENTS supply the following additional documentation as applicable:

1. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.

2. A control sequence describing start-up, operation, and shutdown.

3. Description of the function of each principal item of equipment.

4. Installation instructions.

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5. Safety precautions for operation and maintenance.

6. Diagrams and illustrations.

7. Periodic maintenance and testing procedures and frequencies, including replacement parts numbers and replacement frequencies.

8. Performance data.

9. Where applicable, pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.

10. List of factory approved or qualified permanent servicing organizations for equipment repair and periodic testing and maintenance, including addresses and factory certification qualifications.

1.17 RECORD DRAWINGS

A. The Contractor shall maintain at least one (1) copy of the Specifications and Drawings on the job site at all times.

B. The Architect will provide the Contractor with a suitable set of Contract Drawings on which daily records of changes and deviations from contract shall be recorded. Dimensions and elevations on the record drawings shall locate all buried or concealed piping, conduit, or similar items.

C. The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be permitted.

D. At completion of the project, the Contractor shall submit the marked-up record drawings to the General Contractor prior to final payment.

PART 2 - PRODUCTS

2.1 GENERAL

A. Conditions: Provide new products of manufacturers regularly engaged in production of such equipment. Provide the manufacturer's latest standard design for the type of product specified.

B. Space Limitations: Equipment selected shall conform to the building features and shall be coordinated with all components. Do not provide equipment that will not meet arrangement and space limitations.

2.2 ACCESS PANELS AND DOORS

A. Provide access panels and/or doors where required to maintain access to the electrical installation and where noted on the Drawings.

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B. Plaster/Gypsum Walls and Ceilings

1. 16 gauge frame with not less than a 20 gauge hinged door panel, prime coated steel for general applications, stainless steel for use in toilets, showers and similar wet areas, concealed hinges, screwdriver operated cam latch for general application, key lock for use in public areas, UL listed for use in fire rated partitions if required by the application. Use the largest size access opening possible, consistent with the space and the equipment needing service; minimum size is 12" by 12".

2.3 IDENTIFICATION

A. See Electrical Section 260553 – Identification.

2.4 SEALING AND FIRESTOPPING

A. Non-Rated Penetrations

1. Conduit Penetrations Through Below Grade Walls

a. In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated conduit and the cored opening or a water-stop type wall sleeve.

2. Conduit and Cable Tray Penetrations

a. At conduit and cable tray penetrations of non-rated interior partitions, floors and exterior walls above grade, use urethane caulk in annular space between conduit and sleeve, or the core drilled opening.

PART 3 - EXECUTION

3.1 EXCAVATION AND BACKFILL

A. Perform all excavation and backfill work to accomplish indicated electrical systems installation in accordance with Division 31.

3.2 CONCRETE WORK

A. The Division 3 Contractor will perform all cast-in-place concrete unless noted otherwise elsewhere. Provide all layout drawings, anchor bolts, metal shapes, and/or templates required to be cast into concrete or used to form concrete for the support of electrical equipment.

3.3 CUTTING AND PATCHING

A. Refer to Division 1, General Requirements, Cutting and Patching.

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3.4 EQUIPMENT ACCESS

A. Install all conduit, raceways, and accessories to permit access to equipment for maintenance. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Where access is required in plaster or drywall walls or ceilings, furnish the access doors to the General Contractor and reimburse the General Contractor for installation of those access doors.

3.5 COORDINATION

A. The Contractor shall cooperate with other trades in locating work in a proper manner. Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the general installation, such work shall be done at no extra cost provided such decision is reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to other installations before installing.

B. The Contractor shall verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to light fixtures, panelboards, devices, etc. and recessed or semi-recessed heating units installed in/on architectural surfaces.

C. Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing Contractor's expense.

D. Coordinate clearances in front of and above electrical distribution equipment with other trades to avoid interference issues. Maintain clearances as defined in the National Electrical Code. Pipes, ducts, etc. shall not be installed above electrical distribution equipment.

3.6 SLEEVES

A. Pipe sleeves for conduits 6" in diameter and smaller, in new poured concrete construction, shall be schedule 40 steel pipe, plastic removable sleeve or sheet metal sleeve, all cast in place.

B. In wet area floor penetrations, top of sleeve to be 2 inches above the adjacent floor. In existing wet area floor penetrations, core drill sleeve openings large enough to insert schedule 40 sleeve and grout the area around the sleeve. If a pipe clamp resting on the sleeve supports the pipe penetrating the sleeve, weld a collar or struts to the sleeve that will transfer weight to the existing floor structure. Wet areas for this paragraph are rooms or spaces containing air handling unit coils, converters, pumps, chillers, boilers, and similar waterside equipment.

C. Pipe penetrations in existing concrete floors that are not in wet areas may omit the use of schedule 40 sleeve and use the core drilled opening as the sleeve.

3.7 SEALING AND FIRESTOPPING

A. Non-Rated Surfaces

1. When the opening is through a non-fire rated wall, floor, ceiling or roof the opening must be sealed using an approved type of material.

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2. Install escutcheons or floor/ceiling plates where conduit penetrates non-fire rated surfaces in occupied spaces. Occupied spaces for this paragraph include only those rooms with finished ceilings and the penetration occurs below the ceiling.

3. In exterior wall openings below grade, assemble rubber links of mechanical seal to the proper size for the conduit and tighten in place, in accordance with the manufacturer's instructions. Install so that the bolts used to tighten the seal are accessible from the interior of the building or vault.

4. At interior partitions, conduit penetrations are required to be sealed for all clean rooms, laboratories, and most hospital spaces, computer rooms, dormitory rooms, telephone/data/com rooms and similar spaces where the room pressure or odor transmission must be controlled. Apply sealant to both sides of the penetration in such a manner that the annular space between the conduit sleeve and the conduit is completely filled.

3.8 HOUSEKEEPING AND CLEAN UP

A. The Contractor shall clean up and remove from the premises, daily, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, this Contractor shall remove all tools, excess material and equipment, etc., from the site.

3.9 TESTING

A. Test Conditions

1. Place circuits and equipment into service under normal conditions, collectively and separately, as may be necessary to determine satisfactory operation. Perform specified tests in the presence of the Owner's representative(s). Furnish all instruments, wiring, equipment and personnel required for conducting tests. Demonstrate that the equipment operates in accordance with requirements of the Contract Documents. Special tests on certain items are specified hereinafter.

2. Where specified that the testing be performed by an independent testing company, an Owner-approved National Electrical Testing Association (NETA) certified testing company shall be used. Submit copies of test reports.

3.10 OWNER TRAINING

A. Contractor to provide factory authorized representative and/or field personnel knowledgeable with the operations, maintenance and troubleshooting of the system and/or components defined within this section for a minimum period of 1 hour.

3.11 PROJECT CLOSEOUT REQUIREMENTS

A. Final project closeout tasks

1. Deliver all spare parts listed in each specification section. Deliver to Owner chosen location.

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2. All equipment labeled per specifications.

3. All equipment cleaned and ready for use. Install new fuses in all equipment with fuses; do not use Owner's spare fuses.

B. Contractor requirements

1. Marked up drawings and specifications provided to Engineer for incorporation of as-built drawings or to serve as the as-built drawings depending on the project requirements. As-built drawings shall be clean and legible.

2. Operation and Maintenance (O & M) Manuals shall include the following:

   a. Contractor contact for warranty work
   b. Approved shop drawings, incorporating all review comments
   c. Warranty copies
   d. Equipment start-up reports
   e. Operation and maintenance instructions

3. Utility Rebate Forms

   a. Contractor shall submit completed energy rebate forms for each piece of equipment that is eligible for a rebate. Eligible equipment shall include, but not be limited to the following:
      1) Exterior Lighting
   b. Contractor to complete information regarding equipment. Submit form to Owner; Owner will complete Owner's contact information and send the completed form to the utility.

C. Three (3) final approved O & M Manuals shall be delivered to Owner. Each manual shall be an appropriately sized three (3) ring binder with a vinyl cover and printed spine and cover labels. Each section shall have a printed divider tab. Each section shall be listed in a table of contents at the beginning of the manual.

END OF SECTION

(ELECTRONIC DOCUMENT RELEASE FORM & SUBSTITUTION REQUEST FORMS ATTACHED)

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Document Release Form

Information Requested:

Project Name:
Drawings Requested:

Media Type: (Check all that are applicable)

☐ AutoCAD DWG Files (Version _____)

☐ REVIT Files (Version _____)

☐ Adobe PDF Files

☐ Other

Requesting Party:

Name:

Company:

Signature:

Date:

Address 1:

Address 2:

Email Address:

Phone #:

Bluestone Use:

Form Sent By:

Date:

Bluestone Project #:

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SUBSTITUTION REQUEST FORM (DURING BIDDING)

We submit for your consideration the following product instead of the specified item for the following project:

PROJECT: _____

SPEC. SECTION	SPEC. TITLE	PARAGRAPH	SPECIFIED ITEM
_____	_____	_____	_____

Proposed Substitution: _____

MANUFACTURER	TRADE NAME	MODEL NO.
_____	_____	_____

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including Architectural and Engineering design, detailing, and construction costs caused by the substitution.

Submitted by:

_____
Signature

_____
Firm

_____
Telephone Email Date

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Engineer's Review and Action

☐ Substitution Approved
☐ Substitution Approved As Noted
☐ Substitution Rejected
☐ Substitution Request Received Too Late

Signed by:

_____
Date

Supporting Data Attached:

☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ Other _____

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SUBSTITUTION REQUEST FORM (AFTER BIDDING)

We submit for your consideration the following product instead of the specified item for the following project:

PROJECT: _____

SPEC. SECTION	SPEC. TITLE	PARAGRAPH	SPECIFIED ITEM
_____	_____	_____	_____

Proposed Substitution: _____

MANUFACTURER	TRADE NAME	MODEL NO.
_____	_____	_____

INSTALLER	PHONE NO.
_____	_____

History: ☐ New Product ☐ 2-5 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

_____

_____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

_____

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days

Savings to Owner for accepting substitution: $_____

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including Architectural and Engineering design, detailing, and construction costs caused by the substitution.

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- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by:

_____
Signature

_____
Firm

_____
Telephone Email Date

Engineer's Review and Action

☐ Substitution Approved
☐ Substitution Approved As Noted
☐ Substitution Rejected
☐ Substitution Request Received Too Late

Signed by:

_____
Date

Supporting Data Attached:

☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ Other _____

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SECTION 260504
CLEANING AND TESTING

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide the required cleaning, repair, adjustment, calibration, maintenance and testing of electrical equipment, as specified herein. This applies only to new electrical and existing electrical equipment being furnished, modified, worked on or serviced by this contractor for this project.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

PART 2 - PRODUCTS – (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL INSPECTION AND CLEANING OF ALL ELECTRICAL EQUIPMENT

A. Inspect for physical damage and abnormal mechanical and electrical conditions.

B. Any item found to be out of tolerance, or in any other way defective as a result of the required testing, shall be reported to the Engineer. Procedure for repair and/or replacement will be outlined. After appropriate corrective action is completed the item shall be re-tested.

C. Compare equipment nameplate information with the latest single line diagram and report any discrepancies.

D. Verify proper auxiliary device operation and indicators.

E. Check tightness of accessible bolted electrical joints. Use torque wrench method.

F. Make a close examination of equipment and remove any shipping brackets, insulation, packing, etc. that may not have been removed during original installation.

G. Make a close examination of equipment and remove any dirt or other forms of debris that may have collected in existing equipment or in new equipment during installation.

H. Clean All Equipment:

1. Vacuum inside of panelboards.

2. Loosen attached particles and vacuum them away.

3. Wipe all insulators with a clean, dry, lint free rag.

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4. Clean insulator grooves.

5. Inspect equipment anchorage.

6. Inspect equipment and bus alignment.

7. Check all heater elements for operation and control.

8. Lubricate nonelectrical equipment per manufacturer's recommendations.

3.2 INSTRUMENT TRANSFORMERS

A. Inspect for physical damage.

B. Inspect nameplate information for compatibility with one-line drawings.

C. Verify the transformers' connections with the system requirements.

D. Verify tightness of all bolted connections and assure adequate clearances exist from primary circuits to secondary circuit wiring and to grounds.

E. Verify that all required grounding and shorting connections exist and that those connections have good contact; i.e. sufficient surface area, good cleanliness, and proper pressure.

F. Test the proper operation of transformer withdrawal mechanism and the grounding operation when applicable.

G. Verify proper primary and secondary fuses and required sizes.

3.3 PROTECTIVE RELAYS

A. All relays shall be inspected for physical damage.

B. Inspect cover gaskets and cover glass for presence of foreign material and moisture and then clean.

3.4 METERING AND INSTRUMENTATION

A. Examine all devices for broken parts, damage and wire connection tightness.

B. Meter selector switches and/or buttons shall be inspected for proper application and operation.

3.5 GROUND FAULT SYSTEMS

A. Inspect for physical damage.

B. Inspect the neutral main bonding connection to assure:

1. Zero sequence system is grounded upstream of sensor.
2. Ground strap systems are grounded down stream from the sensing device.

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3. Ground connection is made ahead of the neutral disconnect link.

3.6 CABLES

A. Visual and Mechanical Inspections:

1. Inspect exposed sections for physical damage.

2. Verify cable is supplied and connected in accordance with single line diagram.

3. Inspect for shield grounding, cable support and termination.

4. If cables are terminated through window type C.T.'s make an inspection to verify that neutrals and grounds are properly terminated for normal operation of protective devices.

5. Inspect for visual jacket and insulation condition.

6. Visible cable bends shall be checked against ICEA or manufacturer's minimum allowable bending radii -- 12 times the diameter for tape shielded cables.

7. Inspect for proper fireproofing in common cable areas.

8. There shall be NO tests performed on existing cable without specific direction from the Engineer.

B. Electrical Tests -- Below 600 Volts:

1. All secondary cables from the utility transformer(s) to the secondary panelboard(s) shall be subjected to insulation tests using a 500 vdc megger.

2. Visually inspect cables, lugs, connectors and all other components for physical damage and proper connections

3. Check all cable connectors for tightness (with a torque wrench) and clearances. Torque test conductor and bus terminations to manufacturer's recommendations.

4. Check for proper grounding resistance at all services and at transformers. Resistance shall be 5 ohms maximum.

3.7 PANELBOARDS

A. Torque all the connections per the manufacturers spec. Verify phase wires, color coding, separate neutral and mechanical bonding. Verify circuit breaker operation. Verify the directory is typed and reflects as-built conditions.

3.8 MOTOR STARTERS

A. Verify the control circuits. Confirm the fusing and the grounding of the control transformers. Torque all of the connections. Confirm the overload elements and the circuit breakers (fuse) for proper sizing. Verify all grounding. Operate and test each motor starter for proper operation.

END OF SECTION

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SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLE

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required for furnishing and installing required wiring and cabling systems including pulling, terminating and splicing.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section

B. Section 260533 Raceway and Boxes

C. Section 260553 Identification

1.3 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Conductor sizes are based on copper.

C. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet project conditions.

D. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

PART 2 - PRODUCTS

2.1 GENERAL

A. All wire shall be new, delivered to the site in unbroken cartons and shall be less than one year old out of manufacturer's stock.

B. All conductors shall be copper.

C. Aluminum conductors size #1/0 and larger may be substituted for copper. Aluminum conductors may be substituted for copper feeders in sizes 50 amps and larger. The following requirements shall be met when aluminum conductors are used:

1. Aluminum alloy conductors shall be compact stranded conductors of a recognized Aluminum Association 8000 Series aluminum alloy conductor material (AA-8000 series alloy).

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2. Aluminum alloy conductors must meet or exceed all ASTM specifications, UL Standard 83 and UL Standard 1063 and all requirements as specified in National Electrical Code Article 310.

3. It is the responsibility of the contractor to increase the size of the conduit, wire gutter, or enclosure, if necessary, to accommodate the aluminum conductors and meet allowable code requirements.

4. It is the responsibility of the contractor to increase the size of the aluminum conductor to match the ampacity of the copper conductor circuit shown on the Drawings.

5. All aluminum conductors shall terminate on a mechanical screw-type connector or mechanical compression-type connector. Connector shall be dual rated (ALCU, AL7CU or AL9CU) and Listed by UL for use with aluminum and copper conductors, and sized to accept aluminum conductors of the required ampacity.

6. When using compression-type connectors, the lugs shall be marked with wire size, die index, number and location of crimps and shall be suitably color-coded.

7. Using a suitable stripping tool, remove insulation from the required length of the conductor. Use caution to avoid damage to any of the individual strands.

8. Wire brush the conductor to remove any insulation that may have become trapped between the strands and apply a Listed joint compound.

9. Tighten or crimp the connection per the connector manufacturer's recommendation.

10. Wipe off any excess joint compound.

11. When terminating aluminum conductors to aluminum bus, prepare a mechanical screw-type or compression-type connection. Bolts shall be anodized alloy and conform to current ANSI and ASTM chemical and mechanical property limits. Nuts shall be aluminum alloy and conform to current ANSI standards. Washers shall be flat aluminum alloy, Type A plain, standard wide series conforming to current ANSI standards. Lubricate and tighten the hardware per manufacturer's recommendations.

12. When terminating aluminum conductors to copper bus, prepare a mechanical screw-type or compression-type connection. Bolts shall be plated or galvanized medium carbon steel; heat treated, quenched and tempered equal to current ASTM standard or SAE grade 5. Nuts shall conform to current ANSI standards. Washers shall be steel, Type A plain, standard wide series conforming to current ANSI standards. Belleville conical spring washers shall be of hardened steel, cadmium plated or silicone bronze. Lubricate and tighten the hardware per manufacturer's recommendations.

13. The contractor shall perform an infrared survey of all aluminum conductor connections after the installation is complete and in normal service. Infrared surveys shall be performed during periods of maximum possible loading with at least 30% of rated load of the equipment being inspected. All connections with elevated temperatures shall be corrected by the contractor. The infrared survey results shall be provided in report form, in the completed O&M manuals.

14. No copper-to-aluminum transitions permitted when splicing onto existing copper feeders.

D. Insulation shall have a 600 volt rating.

E. All conductors shall be stranded.

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F. Stranded conductors may only be terminated with UL OR ETL Listed type terminations or methods: e.g. stranded conductors may not be wrapped around a terminal screw but must be terminated with a crimp type device or must be terminated in an approved back wired method.

2.2 BUILDING WIRE

A. Acceptable Manufacturers: American Insulated Wire Corp., BICC General Cable Industries Inc., Cerro Wire & Cable Co. Inc., Pirelli Cable Corp., Rome Cable Corp., or Southwire Co.

B. Single Conductor Insulated Wire.

1. THHN, THW, THW-2, THWN, THWN-2, XHH, XHHW, or XHHW-2: Wiring in dry or damp locations (except where special type insulation is required).
2. THWN, THWN-2, XHHW, XHHW-2: Wiring in wet locations

2.3 METAL CLAD CABLE (TYPE MC)

A. Acceptable Manufacturers: Southwire, AFC Cable Systems Inc., Coleman Cable Co.

B. Comply with NFPA 70, Article 330.

C. Interlocked flexible galvanized steel armor sheath, conforming to UL requirements for type MC metal clad cable.

D. Insulated copper conductors, suitable for 600 volts, rated 90°C, one of the types listed in NFPA 70 Table 310.104(A) or of a type identified for use in Type MC cable.

E. Internal full size copper ground conductor with green insulation.

F. Connectors for MC cable: Bridgeport, Arlington Industries Inc.'s Saddle grip, or Thomas & Betts Co.'s Tite-Bite with anti-short bushings.

2.4 WIRING CONNECTORS

A. Split Bolt Connectors: Not acceptable unless noted otherwise.

B. Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to equipment pads or terminals. Not approved for splicing.

C. Spring Wire Connectors: Solderless spring type pressure connector with insulating covers for copper wire splices and taps. Use for conductor sizes 10 AWG and smaller.

D. All wire connectors used in underground or exterior pull boxes shall be gel filled twist connectors or a connector designed for damp and wet locations.

E. Mechanical Connectors:

1. Bolted type tin-plated; high conductivity copper alloy; spacer between conductors; beveled cable entrances.

F. Insulated Connector Blocks:

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1. Conductor count, size, and entry configuration to match application.

2. UV rated.

3. Dual rated for use with copper or aluminum conductors.

4. 600 volt, 90° C termination rating.

5. Caps for sealing wrench access port.

G. Compression (crimp) Connectors:

1. Long barrel; seamless, tin-plated electrolytic copper tubing; internally beveled barrel ends. Connector shall be clearly marked with the wire size and type and proper number and location of crimps.

2.5 WIRE MANAGEMENT

A. Cable Clamps and Clips, Cable Ties, Spiral Wraps, etc: Catamount/T&B Corp., or Ideal Industries Inc.

PART 3 - EXECUTION

3.1 GENERAL WIRING METHODS

A. Install electrical cable, wire and connectors as indicated, in accordance with the manufacturer's written instructions, the applicable requirements of NEC, and as required to ensure that products serve the intended functions.

B. Cables shall be selected on the basis of their purpose and UL listing.

1. Generally, use Types THWN, XHHW and THNN in building interiors and other dry locations.

2. Outdoors and in underground raceways, use Type THWN or other conductor type rated for wet location as required by NEC 300.5(B).

3. Conductors subject to abrasion, such as in lighting poles, shall be Type THWN or THHN.

C. All wire and cable shall be installed in conduit. Exceptions: Type MC, or other type specifically indicated on the drawings not to be installed in raceways.

D. MC cable may be used in the following applications:

1. Branch circuit wiring in wood framed construction (wood joists and wood stud partitions):

a. Install conductors parallel with joists or studs and attach to the side of these timbers by galvanized straps spaced not more than 6 feet apart.
b. Install conductors through holes bored in the center of the timbers when running at right angles to joists or studs.
c. Do not attach the conductors to the edge of joists or studs.

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2. Branch circuit wiring in metal stud partitions:

   a. Install conductors parallel with studs and attach to the side by galvanized straps spaced not more than 6 feet apart.
   b. Install conductors through holes bored in the center of the metal member when running at right angles to studs.
      1) Conductors shall be protected by listed bushings or listed grommets covering all metal edges.
   c. Do not attach the conductors to the edge of studs.

E. Do not use wire smaller than 12 AWG for power and lighting circuits. Minimum size for control circuits shall be 14 AWG copper stranded.

F. All conductors shall be sized to prevent excessive voltage drop at rated circuit ampacity.

G. As a minimum use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 100 feet, and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.

H. Make conductor lengths for parallel conductors equal.

I. Splice only in junction or outlet boxes.

J. No conductor less than 10 AWG shall be installed in exterior underground conduit.

K. Neatly train and lace wiring inside boxes, equipment, and panelboards.

3.2 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time. Use Listed wire pulling lubricant for pulling 4 AWG and larger wires and for other conditions when necessary.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Completely and thoroughly swab raceway system before installing conductors.

D. Place all conductors of a given circuit (this includes phase wires, neutral (if any), and ground conductor) in the same raceway. If parallel phase and/or neutral wires are used, then place an equal number of phase and neutral conductors in same raceway or cable.

3.3 WIRING CONNECTIONS AND TERMINATIONS

A. Splice only in accessible junction boxes.

B. Wire splices and taps shall be made firm, and adequate to carry the full current rating of the respective wire without soldering and without perceptible temperature rise.

C. All splices shall be so made that they have an electrical resistance not in excess of two feet (600 mm) of the conductor.

D. Use solderless spring type pressure connectors with insulating covers for wire splices and taps, 10 AWG and smaller.

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E. Use mechanical or compression connectors for wire splices and taps, 8 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.

F. Thoroughly clean wires before installing lugs and connectors.

G. At all splices and terminations, leave tails long enough to cut splice out and completely re-splice.

H. Protect wiring in device and junction boxes from paint overspray. Wiring covered with paint shall be removed and replaced where needed by the Contractor.

3.4 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 260504 Cleaning and Testing.

3.5 WIRE COLOR

A. For wire sizes 10 AWG and smaller - Wire shall be colored as indicated below.

B. For wire sizes 8 AWG and larger – Use colored wire, or identify wire with colored ½" or ¾" tape bands at all terminals, splices and boxes. Tape bands shall be installed at every 12" for the entire visible length. Colors to be as indicated below.

C. In new facilities, use the following color scheme:

1. Black and red for single phase circuits at 120/240 volts

2. Phase A black, Phase B red and Phase C blue for circuits at 120/208 volts single or three phase.

3. Neutral Conductors: White for 120/208V and 120/240V systems. Where there are two or more neutrals in one conduit, each shall be individually identified with a different stripe.

4. Note: This includes fixture whips except for Listed whips mounted by the fixture manufacturer on the fixture and Listed as a System.

D. All switch legs shall be the same color as their associated circuit. Traveler conductors run between 3 and 4 way switches shall be colored pink or purple.

E. Ground Conductors: Green for 2 AWG and smaller. For 1 AWG and larger, identify with green colored wire, or with green tape at both ends and at all access points, such as panelboards, motor starters, disconnects and junction boxes.

3.6 IDENTIFICATION

A. Identification Tags: Use tags to identify feeders and designated circuits. Install tags so that they are easily read without moving adjacent feeders or requiring removal of arc proofing tapes. Attach tags with non-ferrous wire or brass chain.

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1. Exterior Feeders: Identify each feeder in manholes and in interior pullboxes and gutters. Identify by feeder number and size, and also indicate building number and panel designation from which feeder originates.

2. Street and Grounds Lighting Circuits: Identify each circuit in manholes and lighting standard bases. Identify by circuit number and size, and also indicate building number and panel designation from which circuit originates.

3.7 WIRE MANAGEMENT

A. Use wire management products to bundle, route, and support wiring in junction boxes, pullboxes, wireways, gutters, channels, and other locations where wiring is accessible.

3.8 BRANCH CIRCUITS

A. The use of single-phase, multi-wire branch circuits with a common neutral is not permitted. All branch circuits shall be furnished and installed with an individual accompanying neutral, sized the same as the phase conductors.

B. The use of a common neutral for modular furniture will be allowed with the following conditions:

1. (Three) 3-phase circuit breaker is used.

2. Neutral is sized 200% larger than phase conductor.

END OF SECTION

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SECTION 260523
CONTROL CABLES

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the required remote control and signal cabling indicated by the Contract Documents with supplementary items necessary for proper installation.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

B. Section 260533 Raceway and Boxes.

C. Section 260553 Identification.

D. NFPA 70 National Electrical Code.

1.3 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Conductor sizes are based on copper.

C. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.

D. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

PART 2 - PRODUCTS

2.1 GENERAL

A. All wire shall be new, delivered to the site in unbroken cartons and shall be less than one year old out of manufacturer's stock.

B. All conductors shall be copper.

C. Insulation shall have a 600 volt rating.

D. All conductors must be suitable for the application intended. Conductors #12 and smaller may be solid or stranded with the following requirements or exceptions:

1. All conductors terminated with crimp type devices must be stranded.

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2. Stranded conductors may only be terminated with UL OR ETL Listed type terminations or methods: e.g. stranded conductors may not be wrapped around a terminal screw but must be terminated with a crimp type device or must be terminated in an approved back wired method.

2.2 REMOTE CONTROL AND SIGNAL CABLE

A. Refer to Division 28 for requirements for cable to be used on safety and security systems.

B. Refer to Division 27 for requirements for cable to be used on communication systems.

C. All other systems cabling shall meet the requirements of NEC Article 725 and the following:

1. Control Cable for Class 1 Remote Control and Signal Circuits: 600 volt insulation, individual conductors twisted together, shielded (where required), and covered with an overall PVC jacket.

   a. Cable shall be Listed, temperature rated, and plenum or non-plenum rated for the application as required in the National Electrical Code.

2. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits shall be constructed, Listed, temperature rated, and plenum or non-plenum rated for the application as required in the NEC Article 725.

2.3 WIRING CONNECTORS

A. Split Bolt Connectors: Not acceptable.

B. Spring Wire Connectors: Solderless spring type pressure connector with insulating covers for copper wire splices and taps. Use for conductor sizes 10 AWG and smaller.

C. All wire connectors used in underground or exterior pull boxes shall be gel filled twist connectors or a connector designed for damp and wet locations.

PART 3 - EXECUTION

3.1 GENERAL WIRING METHODS

A. Low voltage control and signal cables shall be installed in conduit. However, they may be installed without conduit above accessible ceilings if the cable meets NEC requirements for the application, unless specified to be in conduit in other sections of the specifications. See requirements for free-air cabling installation below.

B. Do not use wire smaller than 14 AWG for control wiring greater than 60 volts, or 18 AWG for voltages less than 60 volts, all sizes subject to NEC 725 requirements.

C. Splice only in junction boxes.

D. Identify wire per section 260553.

E. Neatly train and lace wiring inside boxes, and equipment.

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3.2 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Completely and thoroughly swab raceway system before installing conductors.

D. Place all conductors of a given circuit (this includes phase wires, neutral (if any), and ground conductor in the same raceway.

3.3 FREE-AIR CABLE INSTALLATION

A. Free-air installation is allowed for low voltage cabling associated with the following systems:

1. Technology cabling (where cable tray is not available)

2. Control cables (DDC, digital lighting control system, etc.)

B. 'Free-Air' wiring runs shall avoid areas of high traffic (i.e. aisle way), open structure when possible, be run as close as possible to outlining walls and above accessible ceilings when possible.

C. Cabling shall be neatly run at right angles and be kept clear of other trades work.

D. Cabling shall be supported at a maximum of 4-foot intervals utilizing mounting bridal rings or J-hooks anchored to the wall, overhead structure, piping supports or structural steel beams. If cable sag at mid-span exceeds 12-inches, another support shall be provided. **Fire alarm cabling shall be installed in a dedicated support system of J-hooks and/or bridal rings separate from all other low voltage cabling**.

E. Mounting rings/hooks shall be designed to maintain cables bend to larger than the minimum bed radius (typically 4 x cable diameter).

F. Bundle cabling together, where possible, using Velcro straps. **The use of zip ties for cable bundling is NOT allowed**.

G. Cabling being routed above an inaccessible ceiling exceeding 6' in length shall be sleeved using raceway for ease of cable installation and replacement.

H. Cabling shall not be attached to or supported by other systems, including but not limited to: cabling, plumbing or piping, ductwork, suspended ceiling supports or electrical conduit. Additionally, cabling shall not be laid directly on the ceiling grid.

I. To reduce or eliminate Electro-Magnetic Interference (EMI), the following minimum separation distances for 'Free-Air' cabling installations shall be adhered to:

1. Twelve (12) inches from power lines of less than 5kV.

2. Eighteen (18) inches from lighting fixtures.

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3. Thirty-nine (39) inches from transformers and motors.

J. A coil of six (6) feet in each cable shall be placed in the ceiling at each 'free-air' wire device. These coils shall be secured (wire tied) at the last cable support before the cable reaches the device and shall be coiled from 100% to 200% of the cable recommended minimum bend radius.

K. All cable shall be free of tension at both ends. Nylon strain relief connectors shall be provided at each device and junction box where cables enter. In cases where the cable must bear some stress, Kellum type grips may be used to spread the strain over a longer length of cable.

L. Cable manufacturers minimum bend radius shall be observed in all instances. Care should be taken in the use of cable ties to secure and anchor the station cabling. Ties should not be over tightened as to compress the cable jacket. No sharp burrs should remain where excess length of the cable tie has been cut.

M. All exposed vertical cable extensions to devices located below the finished ceiling shall be in conduit.

N. Provide protection for exposed cables where subject to damage.

O. Use suitable cable fittings and connectors.

3.4 WIRING CONNECTIONS AND TERMINATIONS

A. Splice only in accessible junction boxes.

B. All splices shall be so made that they have an electrical resistance not in excess of two (2) feet (600 mm) of the conductor.

C. Use solderless spring type pressure connectors with insulating covers for wire splices and taps, 10 AWG and smaller.

D. Thoroughly clean wires before installing lugs and connectors.

E. At all splices and terminations, leave tails long enough to cut splice out and completely re-splice.

F. Protect wiring in device and junction boxes from paint overspray. Wiring covered with paint shall be removed and replaced where needed by the Contractor.

3.5 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 260504.

END OF SECTION

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SECTION 260526
GROUNDING

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the following grounding indicated by the Contract Documents with supplementary items necessary for proper installation.

B. Equipment included in this Section

1. Grounding electrodes and conductors

2. Equipment grounding conductors

3. Bonding.

1.2 REFERENCES

A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.

B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.

C. All design, materials, installation and testing pertaining to grounding and bonding system shall comply with the latest edition of applicable requirements and standards addressed within the following references:

1. Applicable provisions of Division 1 govern work under this Section

2. Section 260519 – Low Voltage Electrical Power Conductors and Cable

3. NFPA 70 - National Electrical Code.

4. ANSI/IEEE 142 (Latest edition) - Recommended Practice for Grounding of Industrial and Commercial Power Systems.

5. IEEE 81 - Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Ground System.

6. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment (IEEE Emerald Book).

7. IEEE C2 - National Electrical Safety Code (NESC).

8. UL 467 – Grounding and Bonding Equipment.

9. UL 497 - Protectors for Paired-Conductor Communications Circuits.

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10. UL 497A - Secondary Protectors for Communications Circuits.

11. UL 497B - Protectors for Data Communications and Fire-Alarm Circuits

12. UL 1449 - Standard for Safety Surge Protective Devices

13. BICSI Telecommunications Distribution Methods Manual (TDMM), Latest Edition.

14. ANSI J-STD-607-A – Commercial Building Grounding and Bonding Requirements for Telecommunications.

1.3 QUALITY ASSURANCE

A. See Part 3 of this Specification for system requirements and performance requirements.

1.4 SUMMARY

A. Ground the electrical service system neutral at service entrance equipment to counterpoise loop. Electrical systems that are grounded shall be connected to earth in a manner that will limit the voltage imposed by lightning, line surges, or unintentional contact with higher-voltage lines and that will stabilize the voltage to earth during normal operations. Provide a completely grounded system in accordance with Article 250 of the NEC

B. Metal water piping system(s) installed in or attached to a building or structure shall be bonded to the service equipment enclosure, the grounded conductor at the service. Where installed in or attached to a building or structure, a metal piping system(s), including gas piping, that is likely to become energized shall be bonded to the service equipment enclosure, the grounded conductor at the service. The bonding jumper(s) shall be sized in accordance with Article 250 of the NEC.

C. Concrete reinforcing bars shall be permitted for grounding. Connect the structural metal frame to the reinforcing bars of concrete-encased electrode. Concrete-encased electrodes of existing buildings or structures shall not be required to be part of the grounding electrode system where the steel reinforcing bars or rods are not accessible for use without disturbing the concrete.

D. Bond together system service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, metal cable trays, auxiliary gutters, meter fittings, boxes, cable armor, cable sheath, ground bus in electrical rooms, metal frame of the building or structure, ground ring, lightning down lead conductor, grounding conductor in raceways and cables, receptacle ground connectors, and metallic plumbing systems.

1.5 CERTIFICATIONS

A. Two (2) weeks prior to final inspection, submit four (4) copies of the following to the Engineer and General Contractor/Construction Manager:

1. Certification that the materials and installation is in accordance with the drawings and specifications.

2. Certification, by the Contractor, that the complete installation has been properly installed and tested.

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1.6 CLOSEOUT SUBMITTAL AND PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of grounding electrodes. Include the location of system grounding electrode connections and the routing of aboveground and underground grounding electrode conductors.

B. Test Reports: Indicate overall resistance to ground and resistance of each electrode

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

B. Grounding system components shall be as required to comply with the design and construction of the system indicated. Components shall be as indicated in manufacturer's submittal data.

2.2 ROD ELECTRODE

A. Material: Copper-clad steel.

B. Diameter: 3/4 inch minimum.

C. Length: Ten (10) feet minimum.

2.3 PLATE ELECTRODE

A. Copper plates minimum 0.06 inches thick by 2’-0” square feet of surface area.

2.4 MECHANICAL CONNECTORS

A. Products:

1. Ground Clamps (Cable to Pipe):
   a. Blackburn/T&B Corp.’s GUV
   b. Framatome Connectors/Burndy Corp.’s GAR, GD, GP, GK
   c. OZ/Gedney Co.’s ABG, CG
2. Ground Clamps (Cable to Rod):
   a. Blackburn/T&B Corp.’s GG, GGH, JAB, JABH, GUV
   b. Dossert Corp.’s GN, GPC
   c. Framatome Connectors/Burndy Corp.’s GP, GX, GRC
   d. OZ/Gedney Co.’s ABG
3. Ground Lugs - Copper, one (1) or two (2) hole style (to suit conditions), long barrel:
   a. Anderson/Hubbell’s VERSAtile VHCL
   b. Blackburn/T&B Corp.’s Color-Coded CTL, LCN
   c. Framatome Connectors/Burndy’s Hylug YA

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d. Electrical Products Div./3M Scotchlok 31036 or 31145 Series
e. Ideal Industries Inc.'s CCB or CCBL
f. Thomas & Betts Corp.'s 54930BE or 54850BE Series

B. The mechanical connector bodies shall be manufactured from high strength, high conductivity cast copper alloy material. Bolts, nuts, washers and lockwashers shall be made of Silicon Bronze and supplied as a part of the connector body and shall be of the two bolt type.

C. Split bolt connector types are NOT allowed. Exception: the use of split bolts is acceptable for grounding of wire-basket type cable tray, and for cable shields/straps of medium voltage cable.

D. The connectors shall meet or exceed UL 467 and be clearly marked with the catalog number, conductor size and manufacturer.

2.5 COMPRESSION CONNECTORS

A. The compression connectors shall be manufactured from pure wrought copper.

B. The conductivity of this material shall be no less than 99% by IACS standards.

C. The connectors shall meet or exceed the performance requirements of IEEE 837, latest revision.

D. The installation of the connectors shall be made with a compression, tool and die system, as recommended by the manufacturer of the connectors.

E. The connectors shall be clearly marked with the manufacturer, catalog number, conductor size and the required compression tool settings.

F. Each connector shall be factory filled with an oxide-inhibiting compound.

2.6 EXOTHERMIC CONNECTIONS

A. As manufactured by Erico (Cadweld), T&B (Furseweld) or similar.

2.7 GROUND CONDUCTORS

A. Material:

1. Provide 600-volt insulated copper (aluminum not permitted) conductors having a green-colored insulation for grounding electrode and equipment grounding conductors. Use stranded conductors.

2. Conduit grounding conductors shall be insulated copper conductor, green in color to size 2 AWG. Insulated conductors larger than 2 AWG shall be same as phase conductors but identified with green or green/yellow tape at each accessible opening or location in raceway.

3. Provide bare conductors for bonding jumpers.

4. Provide tinned copper conductors for exterior installations.

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B. Grounding Electrode Conductor: Size as shown on drawings, specifications or as required by NFPA 70, whichever is larger.

C. Foundation Electrodes: As shown on drawings or details.

D. Feeder and Branch Circuit Equipment Ground: Size as shown on drawings, specifications or as required by NFPA 70, whichever is larger. Differentiate between the normal ground and the isolated ground when both are used on the same facility.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 GENERAL

A. Install Products in accordance with manufacturer's instructions.

B. Install grounding conductors continuous, without splice or connection, between equipment and grounding electrodes.

C. Size: When grounding and bonding conductors are not sized on Drawings, size the grounding conductors in accordance with NEC. Size bonding jumper so that minimum cross-sectional area is greater than or equal to that of the equivalent grounding conductor as determined from NEC.

D. Mechanical connections shall be accessible for inspection and checking. No insulation shall be installed over mechanical ground connections.

E. Ground connection surfaces shall be cleaned and all buried or inaccessible connections shall be made so that it is impossible to move them.

F. Attach grounds permanently before permanent building service is energized.

G. All grounding electrode conductors shall be installed in PVC conduit, in exposed locations.

3.3 LESS THAN 600 VOLT SYSTEM GROUNDING

A. System Grounding:

1. Main Bonding Jumper: Bond the secondary service neutral to the ground bus in the service equipment.

B. Metallic Piping, Building Steel, and Supplemental Electrode(s)

1. Provide a grounding electrode conductor sized per NEC between the service equipment ground bus and all metallic water and gas pipe systems, building steel, and supplemental or made electrodes. Jumper insulating joints in the metallic piping. All connections to electrodes shall be made with fittings that conform to UL 467.

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C. Provide a supplemental ground electrode and bond to the grounding electrode system. Use driven ground rod(s) on exterior of building.

D. Service Disconnect (Separate Individual Enclosure): Provide a ground bar bolted to the enclosure with lugs for connecting the various grounding conductors

E. Equipment Grounding: Metallic structures (including ductwork and building steel), enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, and other conductive items in close proximity with electrical circuits shall be bonded and grounded.

F. Conduit System:

1. Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor.
2. Non-metallic conduit systems shall contain an equipment grounding conductor, except that non-metallic feeder conduits which carry a grounded conductor from exterior transformers to interior or building-mounted service entrance equipment need not contain an equipment grounding conductor.
3. Install an insulated grounding conductor internally to all flexible metal conduits. All flexible metal conduit containing power circuits shall utilize grounding bushings. The grounding bushing shall contain a bonding jumper and shall be terminated at the equipment ground bus. The grounding conductor shall terminate at the equipment ground bus. Install external ground wire on liquid tight flexible metal conduit. Provide suitable grounding bushing at each end of liquid tight flexible metal conduit at transformers. External ground wire shall be in addition to grounding conductors installed internal to raceway system.
4. Conduit containing only a grounding conductor, and which is provided for mechanical protection of the conductor, shall be bonded to that conductor at the entrance and exit from the conduit.

G. Feeders and Branch Circuits: Install equipment grounding conductors with all feeders and power and lighting branch circuits.

H. Boxes, Cabinets, Enclosures, and Panelboards:

1. Bond the equipment grounding conductor to each pullbox, junction box, outlet box, device box, cabinets, and other enclosures through which the conductor passes.
2. Provide lugs in each box and enclosure for equipment grounding conductor termination.
3. Provide ground bars in panelboards, bolted to the housing, with sufficient lugs to terminate the equipment grounding conductors.

I. Motors and Starters: Provide lugs in motor terminal box and starter housing or motor control center compartment to terminate equipment grounding conductors.

J. Receptacles shall not be grounded through their mounting screws. Ground with a jumper from the receptacle green ground terminal to the device box ground screw and the branch circuit equipment grounding conductor.

K. Ground lighting fixtures to the equipment grounding conductor of the wiring system when the green ground is provided; otherwise, ground the fixtures through the conduit systems. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.

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L. Fixed electrical appliances and equipment shall be provided with a ground lug for termination of the equipment grounding conductor.

3.4 CONDUCTIVE PIPING

A. Bond all conductive piping systems, interior and exterior, to the building to the grounding electrode system. Bonding connections shall be made as close as practical to the equipment ground bus.

B. In operating rooms and at intensive care and coronary care type beds, bond the gases and suction piping, at the outlets, directly to the room or patient ground bus.

3.5 CORROSION INHIBITORS

A. When making ground and ground bonding connections, apply a corrosion inhibitor to all contact surfaces. Use corrosion inhibitor appropriate for protecting a connection between the metals used.

3.6 GROUND ROD INSTALLATION

A. Drive each rod vertically in the earth, not less than 10 feet in depth.

B. Where permanently concealed ground connections are required, make the connections by the exothermic process to form solid metal joints. Make accessible ground connections with mechanical pressure type ground connectors.

C. Where rock prevents the driving of vertical ground rods, install angled ground rods or grounding electrodes in horizontal trenches to achieve the specified resistance.

3.7 GROUND RESISTANCE

A. Grounding system resistance to ground shall not exceed 5 ohms. Make necessary modifications or additions to the grounding electrode system for compliance without additional cost to the Owner. Final tests shall assure that this requirement is met.

B. Resistance of the grounding electrode system shall be measured using a four-terminal fall-of-potential method as defined in IEEE 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

C. Services at power company interface points shall comply with the power company ground resistance requirements.

D. Engineer has the option to observe below-grade connections prior to backfilling. The Contractor shall notify the Engineer 24 hours before the connections are ready for observation.

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3.8 FIELD QUALITY CONTROL

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

END SECTION

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SECTION 260529
HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the following hangers and supports indicated by the Contract Documents with supplementary items necessary for proper installation.

B. Equipment included in this Section

1. Conduit and equipment supports
2. Straps
3. Clamps
4. Steel channel, etc.
5. Fastening hardware for supporting electrical work.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

1.3 QUALITY ASSURANCE

A. Support systems shall be adequate for the weight of equipment and conduit, including wiring, which they carry.

PART 2 - PRODUCTS

2.1 ANCHORING DEVICES

A. Sleeve Anchors

1. Molly/Emhart's Parasleeve Series
2. Phillips' Red Head Dynabolt Series
3. Ramset's Dynabolt Series

B. Wedge Anchors

1. Hilti's Kwik Bolt Series
2. Molly/Emhart's Parabolt Series

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3. Phillips' Red Head Trubolt

4. Ramset's Trubolt Series

C. Concrete Screw Anchors

1. Phillips' Red Head Tapcon

D. Non-Drilling Anchors

1. Hilti's Drop-In Anchor Series

2. Phillips' Red Head Multi-Set II Series

3. Ramset's Dynaset Series

E. Stud Anchors

1. Phillips' Red Head JS Series

2.2 CAST-IN-PLACE CONCRETE INSERTS

A. Continuous Slotted Type Concrete Insert, Galvanized:

1. Load Rating 1300 lbs./ft.: Kindorf's D-986

2. Load Rating 2400 lbs./ft.: Kindorf's D-980

3. Load Rating 3000 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-H

4. Load Rating 4500 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-HD

B. Threaded Type Concrete Insert: Galvanized ferrous castings, internally threaded.

C. Wedge Type Concrete Insert: Galvanized box-type ferrous castings, designed to accept bolts having special wedge shaped heads.

2.3 HAMMER SET ANCHOR

A. Zinc plated steel drive pin with expanding alloy body:

1. Phillips' Red Head HS Series

2. Hilti HIT Series

3. Ramset Shuredrive Series

2.4 MISCELLANEOUS FASTENERS

A. Except where shown otherwise on the Drawings, furnish fastener type, size, and grade required for proper installation of the Work. Select from the following:

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1. Cadmium or Zinc Coated Fasteners: Dry locations.

2. Galvanized Fasteners: For exterior use, or for items anchored to exterior walls, except where stainless steel is indicated.

3. Stainless Steel Fasteners: Type 302 for interior Work; Type 316 for exterior Work; Phillips head screws and bolts for exposed Work unless otherwise specified.

2.5 HANGER RODS

A. Mild low carbon steel, unless otherwise specified; fully threaded or threaded each end, with nuts as required to position and lock rod in place. Unless galvanized or cadmium plated, provide a shop coat of red lead or zinc chromate primer paint.

B. Minimum sized threaded rod for supports shall be 3/8” for trapezes and single conduits 1-1/4” and larger, and 1/4” for single conduits 1” and smaller.

2.6 CHANNEL SUPPORT SYSTEM

A. Channel Material: 12 gauge steel.

B. Finishes

1. Phosphate and baked green enamel/epoxy.

2. Pre-galvanized.

3. Electro-galvanized.

4. Hot dipped galvanized.

5. Polyvinyl chloride (PVC), minimum 15 mils thick.

C. Fittings: Same material and finish as channel.

D. UL Listed Systems

1. B-Line Systems Inc.’s B-22 (1-5/8 x 1-5/8 inches), B-12 (1-5/8 x 2-7/16 inches), B-11 (1-5/8 x 3-1/4 inches).

2. Grinell Corp.’s Allied Power-Strut PS 200 (1-5/8 x 1-5/8 inches), PS 150 (1-5/8 x 2-7/16 inches), PS 100 (1-5/8 x 3-1/4 inches).

3. Kindorf’s B-900 (1-1/2 x 1-1/2 inches), B-901 (1-1/2 x 1-7/8 inches), B-902 (1-1/2 x 3 inches).

4. Unistrut Corp.’s P-3000 (1-3/8 x 1-5/8 inches), P-5500 (1-5/8 x 2-7/16 inches), P-5000 (1-5/8 x 3-1/4 inches).

5. Versabar Corp.’s VA-1 (1-5/8 x 1-5/8 inches), VA-3 (1-5/8 x 2-1/2 inches).

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2.7 MISCELLANEOUS FITTINGS

A. Pipe Straps (Heavy Duty Type):

1. Two (2) Hole Steel Conduit Straps:

   a. B-Line Systems Inc.'s B-2100 Series
   b. Kindorf's C-144 Series
   c. Unistrut Corp.'s P-2558 Series

2. One (1) Hole Malleable Iron Clamps:

   a. Kindorf's HS-400 Series
   b. OZ/ Gedney Co.'s 14-G Series, 15-G Series (EMT)

B. Deck Clamps: Caddy/Erico Products Inc.

C. Supporting Fasteners (Metal Stud Construction): Metal stud supports, clips and accessories as produced by Caddy/Erico Products Inc.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Where specific fasteners are not specified or indicated for securing items to in-place construction, provide appropriate type, size, and number of fasteners for a secure, rigid installation.

B. Install anchoring devices and other fasteners in accordance with manufacturer's printed instructions.

C. Make attachments to structural steel wherever possible.

3.2 FASTENER SCHEDULE

A. Material

1. Use cadmium or zinc coated anchors and fasteners in dry locations.

2. Use hot dipped galvanized or stainless steel anchors and fasteners in damp and wet locations.

3. For corrosive atmospheres or other extreme environmental conditions, use fasteners made of materials suitable for the conditions.

B. Types and Use: Unless otherwise specified or indicated use:

1. Cast-in-place concrete inserts in fresh concrete construction for direct pull-out loads such as shelf angles or fabricated metal items and supports attached to concrete slab ceilings.

2. Anchoring devices to fasten items to solid masonry and concrete when the anchor is not subjected to pull out loads, or vibration in shear loads.

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3. Toggle bolts to fasten items to hollow masonry and stud partitions.

4. Metallic fasteners installed with electrically operated or powder driven tools for approved applications, except:

   a. Do not use powder driven drive pins or expansion nails.
   b. Do not attach powder driven or welded studs to structural steel less than 3/16 inch thick.
   c. Do not support a load, in excess of 250 lbs from any single welded or powder driven stud.
   d. Do not use powder driven fasteners in precast concrete

5. Metallic hammer set anchors may be used in wall and ceiling applications. Maximum conduit size supported with hammer set anchors is 1 Inch.

3.3 ATTACHMENT SCHEDULE

A. General: Make attachments to structural steel or steel bar joists wherever possible. Provide intermediate structural steel members where required by support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of 5.

   1. Make attachments to steel bar joists at panel points of joists.

   2. Do not drill holes in main structural steel members.

   3. Use “C” beam clamps for attachment to steel beams.

B. Where it is not possible to make attachments to structural steel or steel bar joists, use the following methods of attachment to suit type of construction unless otherwise specified or indicated on the drawings.

   1. Attachment to Cast-In-Place Concrete:

      a. Fresh Concrete: Use cast-in-place concrete inserts.

   2. Attachment to Wood Construction: Use side beam brackets fastened to the sides of wood members to make attachments for hangers.

      a. Under 15 lbs Load: Attach side beam brackets to wood members with two (2) No. 18 x 1-1/2” long wood screws, or two (2) No. 16 x 1-1/2” long drive screws.
      b. Over 15 lbs Load: Attach side beam brackets to wood members with bolts and nuts or lag bolts. Do not use lag bolts in wooden members having a nominal thickness (beam face) under two (2) inches in size. Install bolts and nuts or lag bolts in the side of wood members at the mid-point of slightly above. Install plain washers under all nuts.
         1) 15-30 lb load: 3/8” x 1-3/4” lag bolts or 3/8” diameter bolts.
         2) 31-50 lb load: 1/2” x 2” lag bolts or 1/2” diameter bolts.
         3) Over 50 lb load (to load limit of structure): 5/8” diameter bolts.
      c. Bottom chord of wood trusses may be utilized as structural support, but method of attachment must be specifically approved.
      d. Do not make attachments to the diagonal or vertical members of wood trusses.
      e. Do not make attachments to the nailing strips on top of steel beams.

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3. Attachment to Metal Stud Construction: Use supporting fasteners manufactured specifically for the attachment of raceways and boxes to metal stud construction.

   a. Support and attach outlet boxes so that they cannot torque/twist by using one of the following:
      1) Bar hanger assembly.
      2) Box hanger with far side support.
      3) Between stud mounting bracket.

3.4 CONDUIT SUPPORT SCHEDULE

A. Provide number of supports as required by National Electrical Code. Exception: Maximum support spacing allowed is 4'-0" for conduit sizes 3 inches and larger supported from wood trusses.

B. Use pipe straps and specified method of attachment where conduit is installed proximate to surface of wood or masonry construction.

   1. Use hangers secured to surface with specified method of attachment where conduit is suspended from the surface.

C. Use "C" beam clamps and hangers where conduit is supported from steel beams.

D. Use deck clamps and hangers where conduit is supported from steel decking having hanger tabs.

   1. Where conduit is supported from steel decking that does not have hanger tabs, use clamps and hangers secured to decking, utilizing specified method of attachment.

E. Use channel support system supported from structural steel for multiple parallel conduit runs.

F. Where conduits are installed above ceiling, do not rest conduit directly on runner bars, T-Bars, etc.

   1. Conduit Sizes 2-1/2 Inches and Smaller: Support conduit from ceiling supports or from construction above ceiling.

   2. Conduit Sizes Over 2-1/2 Inches: Support conduit from concrete deck, beams, joists, or trusses above ceiling.

3.5 CHANNEL SUPPORT SYSTEM SCHEDULE

A. Use channel support system where specified or indicated on the drawings.

B. Channel supports may be used, as approved, to accommodate mounting of equipment.

C. Material and Finish:

   1. Dry Locations: Use 12 gauge steel channel support system having any one of the specified finishes.

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2. Damp Locations: Use 12 gauge steel channel support system having any one of the specified finishes except green epoxy/enamel.

3. Wet locations: Use 12 gauge steel channel support system having hot dipped galvanized, or PVC finish.

END OF SECTION

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SECTION 260533
RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the following conduits, surface raceways, multi-outlet assemblies, auxiliary gutters, wall duct, and boxes for electrical systems including wall and ceiling outlet boxes, floor boxes, and junction boxes.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this section.

B. Section 260529 – Hangers and Supports.

C. Section 262726 – Wiring Devices.

D. Section 262702 – Equipment Wiring.

E. Section 270000 – Communications Cable and Equipment.

PART 2 - PRODUCTS

2.1 RIGID METAL CONDUIT AND FITTINGS

A. Conduit: Heavy wall, galvanized steel, schedule 40, threaded.

B. Fittings and Conduit Bodies: Use all steel threaded fittings and conduit bodies.

2.2 PVC COATED RIGID METAL CONDUIT

A. PVC Externally Coated Conduit: Rigid heavy wall, schedule 40, steel conduit with external 40 mil PVC coating. Conduit must be hot dipped galvanized inside and out including threads. The PVC coating bond to the galvanized steel conduit shall be stronger than the tensile strength of the coating itself.

B. Fittings and Conduit Bodies: Threaded type, material to match conduit. PVC coated fittings and couplings shall have specially formed sleeves to tightly seal to conduit PVC coating. The sleeves shall extend beyond the fitting or coupling a distance equal to the pipe outside steel diameter or two inches whichever is greater.

2.3 INTERMEDIATE METAL CONDUIT (IMC) AND FITTINGS

A. Conduit: Galvanized steel, threaded.

B. Fittings and Conduit Bodies: Use all steel threaded fittings and conduit bodies.

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2.4 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS

A. Conduit: Steel, galvanized tubing.

B. Fittings:

1. All steel, set screw, concrete tight. No push-on or indenter types permitted.

2. Raintight Fittings:

a. All steel construction with zinc electroplate finish provides for durable corrosion resistance
b. Distinct color to provide quick raintight identification
c. Integral gasketed compression ring secures and seals for reliable installation
d. Gasket on male threads of box connector seals installation for raintight connection between the box and the connector

C. Conduit Bodies: All steel threaded conduit bodies.

2.5 FLEXIBLE METAL CONDUIT AND FITTINGS

A. Conduit: steel, galvanized, spiral strip.

B. Fittings and Conduit Bodies: All steel, galvanized, or malleable iron (except as allowed in Specification 265113).

2.6 LIQUIDTIGHT FLEXIBLE METAL CONDUIT AND FITTINGS

A. Conduit: flexible, steel, galvanized, spiral strip with an outer Liquidtight, nonmetallic, sunlight-resistant jacket.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1, compression type. There shall be a metallic cover/insert on the end of the conduit inside the connector housing to seal the cut conduit end.

2.7 RIGID NONMETALLIC CONDUIT AND FITTINGS

A. Conduit: Schedule 40 PVC minimum, Listed, sunlight resistant, rated for 90° C conductors.

B. Fittings and Conduit Bodies: NEMA TC 2, Listed.

2.8 HIGH DENSITY POLYETHYLENE

A. Minimum Size: Two (2) inch, unless noted otherwise

B. Acceptable Manufacturers

1. Carlon

2. Chevron Phillips Chemical Company

3. Approved equal

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C. Materials used for the manufacture of polyethylene pipe and fittings shall be extra high molecular weight, high-density polyethylene resin. The material shall be listed by PPI (Plastic Pipe Institute).

D. The pipe shall contain no recycled compound except that generated in the manufacturer's own plant from resin of the same raw material, including both the base resin and coextruded resin. The pipe shall be homogeneous throughout and free of visible cracks, holes, voids, foreign inclusions, or other defects that may affect the wall integrity.

2.9 HDPE FITTINGS AND CONDUIT BODIES

A. Directional Bore and Plow Type Installation: Electrofusion or Universal Aluminum threaded couplings. Tensile strength of coupled pipe must be greater than 2,000 lbs.

B. For all other type of installation: Coupler must provide a water tight connection. The tensile strength of coupled pipe must be greater than 1,000 lbs.

C. E-loc type couplings are not acceptable in any situations.

2.10 CONDUIT SUPPORTS

A. See Section 260529.

2.11 OUTLET BOXES

A. Sheet Metal Outlet Boxes: galvanized steel, with stamped knockouts.

B. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 3/8 inch male fixture studs where required.

C. Concrete Ceiling Boxes: Concrete type.

D. Cast Boxes: Cast ferroalloy, or aluminum type deep type, gasketed cover, threaded hubs.

2.12 PULL AND JUNCTION BOXES

A. Pull boxes and junction boxes shall be minimum 4 inch square by 2 1/8th inches deep for use with 1 inch conduit and smaller. On conduit systems using 1 1/4 inch conduit or larger, pull and junction boxes shall be sized per NEC but not less than 4 11/16 inch square.

B. Sheet Metal Boxes: code gauge galvanized steel, screw covers, flanged and spot welded joints and corners.

C. Sheet metal boxes larger than twenty-four (24) inches in any dimension shall have a hinged cover or a chain installed between box and cover.

D. Cast Metal Boxes for Outdoor and Wet Location Installations: Type 4 and Type 6, flat-flanged, surface-mounted junction box, UL listed as raintight. Galvanized cast iron or aluminum box and cover with ground flange, neoprene gasket, and stainless steel cover screws.

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E. Fiberglass or Concrete Handholes:

1. With weatherproof cover of non-skid finish shall be used for underground installations.

2. Size, type, weight rating, and labeling shall be as noted on the drawings.

F. The use of box extension rings is discouraged. If they must be used only one ring per box is allowed and wiring must extend a minimum of 6” beyond the front edge of the extension ring.

G. Box extensions and adjacent boxes within 48” of each other are not allowed for the purpose of creating more wire capacity.

H. Junction boxes 6" x 6" or larger size shall be without stamped knock-outs.

I. Wireways shall not be used in lieu of junction boxes.

2.13 GENERAL

A. All steel fittings and conduit bodies shall be galvanized.

B. No cast metal or split-gland type fittings permitted.

C. Mogul-type condulets larger than two (2) inch not permitted except as approved or detailed.

D. All condulet covers must be fastened to the condulet body with screws and be of the same manufacture.

E. Wireways, gutters and c-condulets shall not be used in lieu of pull boxes and condulets.

F. All boxes shall be of sufficient size to provide free space for all conductors enclosed in the box and shall comply with NEC requirements.

PART 3 - EXECUTION

3.1 CONDUIT SIZING, ARRANGEMENT, AND SUPPORT

A. EMT is permitted to be used in sizes 4" and smaller for power and telecommunication systems. See CONDUIT INSTALLATION SCHEDULE below for other limitations for EMT and other types of conduit.

B. Size power conductor raceways for conductor type installed. Conduit size shall be 1/2 inch minimum except all homerun conduits shall be 3/4”, or as specified elsewhere. Caution: Per the NEC, the allowable conductor ampacity is reduced when more than three (3) current-carrying conductors are installed in a raceway. Contractor must take the NEC ampacity adjustment factors into account when sizing the raceway and wiring system.

C. Size conduit for all other wiring, including but not limited to data, control, security, fire alarm, telecommunications, signal, video, etc. shall be sized per number of conductors pulled and their cross-section. 40% fill shall be maximum for all new conduit fills.

D. Arrange conduit to maintain headroom and present a neat appearance.

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E. Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.

F. Maintain minimum six (6) inch clearance between conduit and piping. Maintain twelve (12) inch clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.

G. Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized pipe straps, conduit racks (lay-in adjustable hangers), clevis hangers, or bolted split stamped galvanized hangers.

H. Group conduit in parallel runs where practical and use conduit rack (lay-in adjustable hangers) constructed of steel channel with conduit straps or clamps. Provide space for 25 percent additional conduit.

I. Do not fasten conduit with wire or perforated pipe straps. Before conductors are pulled, remove all wire used for temporary conduit support during construction.

J. Support and fasten metal conduit at a maximum of eight (8) feet on center.

K. Supports shall be independent of the installations of other trades, e.g. ceiling support wires, HVAC pipes, other conduits, etc., unless so approved or detailed.

L. In general, all conduits shall be concealed except where noted on the drawings or approved by the Architect/Engineer. Contractor shall verify with Architect/Engineer all surface conduit installations except in mechanical, electrical or utility rooms that are not occupied spaces.

M. Changes in direction shall be made with symmetrical bends, cast steel boxes, stamped metal boxes or cast steel conduit bodies.

N. For indoor conduits, no continuous conduit run shall exceed 100 feet without a junction box.

O. All conduits installed in exposed areas shall be installed with a box offset before entering box.

3.2 CONDUIT INSTALLATION

A. Ground and bond conduit under provisions of Section 260526.

B. Cut conduit square; de-burr cut ends.

C. Conduit shall not be fastened to the corrugated metal roof deck. Maintain a minimum six (6) inch separation from the roof deck to conduits.

D. Bring conduit to the shoulder of fittings and couplings and fasten securely.

E. Use conduit hubs for fastening conduit to cast boxes. Use sealing locknuts or conduit hubs for fastening conduit to sheet metal boxes in damp or wet locations.

F. All conduit terminations (except for terminations into conduit bodies) shall use conduit hubs, or connectors with one (1) locknut, or shall use double locknuts (one (1) each side of box wall) and insulated bushing. Provide bushings for the ends of all conduit not terminated in box walls.

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Refer to Section 260526 – Grounding and Bonding for Electrical Systems for grounding bushing requirements.

G. Install no more than the equivalent of four (4) 90 degree bends between boxes.

H. Use hydraulic one (1)-shot conduit bender or factory elbows for bends in conduit larger than two (2) inch size unless sweep elbows are required.

I. Conduit shall be bent according to manufacturers' recommendations. Torches or open flame shall not be used to aid in bend of PVC conduit.

J. Use suitable conduit caps or other approved seals to protect installed conduit against entrance of dirt and moisture.

K. Provide 1/8 inch nylon pull string in empty conduit, except sleeves and nipples.

L. Install expansion-deflection joints where conduit crosses building expansion joints. Note: expansion-deflection joints are not required where conduit crosses building control joints if the control joint does not act as an expansion joint. Install expansion fitting in PVC conduit runs as recommended by the manufacturer.

M. Avoid moisture traps where possible. Where moisture traps are unavoidable, provide junction boxes with drain fittings at conduit low points.

N. Where conduit passes between areas of differing temperatures such as into or out of unheated and heated spaces, buildings, etc., provide Listed conduit seals to prevent the passage of moisture and water vapor through the conduit.

O. Route conduit through roof openings for piping and ductwork where possible.

P. Conduit is not permitted in any slab topping of two inches or less. Consult Structural Engineer for approval of conduit installed in topping slabs greater than two inches.

Q. Maximum Size Conduit in Slabs Above Grade: 3/4 inch. Do not route conduits to cross each other in slabs above grade.

R. PVC conduit shall transition to galvanized rigid metal conduit before it enters a concrete pole base, foundation, wall (where exposed) or up through a concrete floor.

S. All conduit installed underground (exterior to building) shall be buried a minimum of 24" below finished grade, whether or not the conduit is concrete encased.

1. All underground conduits shall be installed with "DANGER – BURIED ELECTRICAL CONDUIT" red flagging tape 6-inches above conduit. Tape shall be continuous along the conduit run.

2. Tracer wire shall be installed on all exterior electrical utilities. Trace wire to be fourteen (14) gauge minimum solid copper with thermoplastic insulation recommended for direct burial. Wire connectors to be 3M DBR, or approved equal, and shall be watertight to provide electrical continuity. Install trace wire in the same trench with the conduit during installation and secure to conduit as required to ensure that the wire remains adjacent to the conduit. Trace wire access points shall in general be no more than 500' apart.

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T. PVC conduit shall be cleaned with solvent, and dried before application of glue. The temperature rating of glue/cement shall match weather condition. Apply full even coat of cement/glue to entire area that will be inserted into fitting. The entire installation shall meet manufacturers' recommendations.

3.3 CONDUIT INSTALLATION SCHEDULE

A. Conduit other than that specified below for specific applications shall not be used.

B. Conduit in patient care areas shall be metallic to maintain dual ground paths as required by the NEC.

C. Underground Installations Within Five Feet of Foundation Wall: Rigid steel conduit.

D. Underground Installations More than Five Feet From Foundation Wall: Schedule 40 PVC conduit.

E. Directional Boring: HDPE conduit.

F. Under Slab on Grade Installations: Schedule 40 PVC conduit

G. Exposed Outdoor Locations: Rigid steel conduit

H. Concealed in Concrete and Block Walls: Electrical metallic tubing.

I. Within Concrete Slab: Schedule 40 PVC conduit.

J. Wet Interior Locations: Schedule 40 PVC conduit

K. Concealed Dry Interior Locations: Electrical metallic tubing.

L. Exposed Dry Interior Locations: Electrical metallic tubing.

M. Motor and equipment connections: Flexible PVC coated metal conduit (all locations). Minimum length shall be one foot, maximum length shall be three feet. Conduit must be installed perpendicular to direction of equipment vibration to allow conduit to freely flex.

N. Light fixtures: Direct box or conduit connection for surface mounted and recessed fixtures. Flexible metal conduit from a J-box for recessed lay-in light fixtures. Conduit size shall be 3/8" minimum diameter and six (6) foot maximum length. Conduit length shall allow movement of fixture for maintenance purposes.

3.4 COORDINATION OF BOX LOCATIONS

A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.

B. Electrical box locations shown on Contract Drawings are approximate unless dimensioned. Verify location of floor boxes and outlets in offices and work areas prior to rough-in.

C. No outlet, junction, or pull boxes shall be located where it will be obstructed by other equipment, piping, lockers, benches, counters, etc.

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D. Boxes shall not be fastened to the metal roof deck. Maintain a minimum six (6) inch separation from the roof deck to boxes.

E. It shall be the Contractor's responsibility to study drawings pertaining to other trades, to discuss location of outlets with workmen installing other piping and equipment and to fit all electrical outlets to job conditions.

F. In case of any question over the location of an outlet, the Contractor shall refer the matter to the Architect/Engineer and install outlet as instructed by the Architect/Engineer.

G. The proper location of each outlet is considered a part of this contract and no additional compensation will be paid to the Contractor for moving outlets which were improperly located.

H. Locate and install boxes to allow access to them. Where installation is inaccessible, coordinate locations and provide 18 inch by 24 inch access doors.

I. Locate and install to maintain headroom and to present a neat appearance.

J. Install boxes to preserve fire resistance rating of partitions and other elements, using approved materials and methods.

K. Install boxes to preserve room acoustic ratings using approved material and methods.

L. Boxes mounted in common walls of adjacent rooms shall be offset by at least one stud space to minimize sound transference between rooms. If space does not allow for offsetting of boxes for adjacent rooms by one stud cavity, sound dampening material such as sound batting shall be installed around and between boxes.

3.5 OUTLET BOX INSTALLATION

A. Provide recessed outlet boxes in finished areas; secure boxes to interior wall and partition studs, accurately positioning to allow for surface finish thickness. The front edge of the box, plaster ring, extension ring, or listed extender shall not be set back of the finished wall surface more than ¼" in accordance with NEC 314.20. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.

B. Do not install boxes back-to-back in walls. Provide minimum 6 inch separation, except provide minimum 24 inch separation in acoustic-rated walls.

C. Power

1. Recessed (1/4" maximum) outlet boxes in masonry, concrete or tile construction shall be minimum 4 inch square, with device rings. Device covers shall be square-cut except rounded corner plaster rings are allowed in drywall applications. Angle cut plaster rings are not permitted. Coordinate masonry cutting to achieve neat openings for boxes.

D. Low Voltage

1. Recessed (1/4" maximum) outlet boxes in masonry, concrete or tile construction shall be minimum 4-11/16" square, 2-1/8" deep. Device covers shall be square-cut except rounded corner plaster rings are allowed in drywall applications. Angle cut plaster rings are not permitted. Coordinate masonry cutting to achieve neat openings for boxes.

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E. Provide knockout closures for unused openings.

F. Support boxes independently of conduit except for cast boxes that are connected to two (2) rigid metal conduits, both supported within twelve (12) inches of box.

G. Use multiple-gang boxes where more than one device are mounted together; do not use sectional boxes. Provide non-metallic barriers to separate wiring of different voltage systems.

H. Install boxes in walls without damaging wall insulation.

I. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

J. Ceiling outlets shall be four (4) inch square, minimum 2-1/8 inch deep except that concrete boxes and plates will be approved where applicable. Position outlets to locate luminaires as shown on reflected ceiling plans.

K. In inaccessible ceiling areas, position outlets and junction boxes within 6 inches of recessed luminaire, to be accessible through luminaire ceiling opening.

L. Align wall-mounted outlet boxes for switches, thermostats, and similar devices.

M. Provide cast ferroalloy or aluminum outlet boxes in exterior and wet locations.

N. Surface wall outlets shall be four (4) inch square with raised covers for one (1) and two (2) gang requirements. For three (3) gang or larger requirements, use gang boxes with non-overlapping covers.

3.6 PULL AND JUNCTION BOX INSTALLATION

A. Locate pull boxes and junction boxes above accessible ceilings, in unfinished areas or furnish and install access panels in non-accessible ceilings where boxes are installed. All boxes are to be readily-accessible.

B. Support pull and junction boxes independent of conduit.

END OF SECTION

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SECTION 260553
IDENTIFICATION

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the labeling of power, lighting, general wiring, signal, fire alarm, and cabling.

1.2 REFERENCES

A. Applicable provisions of Division 1 shall govern work under this section.

B. Section 260519 – Low Voltage Electrical Power Conductors and Cables

PART 2 - PRODUCTS

2.1 MATERIALS

A. Labels: All labels shall be permanent, and machine generated. NO HANDWRITTEN OR NON-PERMANENT LABELS ARE ALLOWED. Exception: Back side of device plates and junction boxes may use handwritten, legible labeling on box covers, unless specifically prohibited by other specification sections.

B. Cable label size shall be appropriate for the conductor or cable size(s), outlet faceplate layout and patch panel design. All labels shall be self-laminating, white/transparent vinyl and be wrapped around the cable or sheath. Labels for power conductors (600V and lower) shall be cloth-type. Flag type labels are not allowed. The labels shall be of adequate size to accommodate the circumference of the cable being labeled and properly self-laminate over the full extent of the printed area of the label.

C. Nameplates: Engraved three-layer laminated plastic, white letters on a black background. Emergency system (Level 1 and Level 2) shall use white letters on red background.

D. Tape (phase identification only): Scotch #35 tape in appropriate colors for system voltage and phase.

E. Adhesive type labels not permitted except for phase and wire identification. Machine generated adhesive labels shall be permitted for device plates, 4-11/16” and smaller junction boxes, fire alarm and control devices.

PART 3 - EXECUTION

3.1 GENERAL

A. All branch circuit and power panels must be identified with the same symbol used in circuit directory in main distribution center.

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B. Clean all surfaces before attaching labels with the label manufacturer's recommended cleaning agent.

C. Install all labels firmly as recommended by the label manufacturer.

D. Labels shall be installed plumb and neatly on all equipment.

E. Install nameplates parallel to equipment lines.

F. Secure nameplates to equipment fronts using screws, rivets or manufacturer approved adhesive or cement.

G. Embossed tape will not be permitted for any application.

3.2 JUNCTION AND PULLBOX IDENTIFICATION

A. Provide circuit numbers, and source panel designations for power wiring. Other system shall be identified as shown on details or approved shop drawings. Temperature control shall identify the source.

3.3 POWER AND CONTROL WIRE IDENTIFICATION

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings for control wiring.

B. All wiring shall be labeled within 2 to 4 inches of terminations. Each end of a wire or cable shall be labeled as soon as it is terminated including wiring used for temporary purposes.

3.4 WIRING DEVICE IDENTIFICATION

A. Wall switches, line voltage wall dimmers, motor switches, receptacles (interior, exterior, floor boxes, etc.), photocells and time clocks shall be identified with circuit numbers and source. Labeling shall be permanent and machine generated. Label shall have 1/4" black text on a clear label. Label shall be installed at consistent location on the face of the device cover plate.

3.5 NAMEPLATE ENGRAVING

A. Provide nameplates of minimum letter height as scheduled below.

B. Panelboards, Switchboards and Motor Control Centers: 1 inch; identify equipment designation. 1/2 inch; identify voltage rating, source and room location of the source.

C. Equipment Enclosures: 1 inch; identify equipment designation. 1/2 inch; identify voltage rating, source and room location of the source where applicable.

D. Circuit Breakers, Switches, and Motor Starters/VFD's in Panelboards or Switchboards or Motor Control Centers: 1/2 inch; identify circuit and load served, including location.

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E. Junction boxes: 1 inch; identify system source(s) and load(s) served. Junction boxes may be neatly identified using a permanent marker.

3.6 PANELBOARD DIRECTORIES

A. Typed directories for panels must be covered with clear plastic, have a metal frame. Room number on directories shall be Owner's numbers, not Plan numbers unless Owner so specifies.

END OF SECTION

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SECTION 262416
PANELBOARDS

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the main, distribution and branch circuit panelboards indicated by the Contract Documents with supplementary items necessary for proper installation.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

1.3 SUBMITTALS

A. Include outline and support point dimensions, voltage, main bus ampacity, and integrated short circuit ampere rating.

B. Circuit breaker enumeration (frame, ATE, poles, I.C.): Indicate if circuit breakers are suitable for the panelboards' Fully Rated Equipment Rating, or where acceptable, are series connected devices that have been test verified and listed with UL (include documentation proving the compatibility of the proposed circuit breaker combinations). Circuit breakers do not have to be listed as series connected devices when all of the circuit breaker interrupting ratings are equal to, or greater than, the short circuit rating of the panelboard.

C. When indicated on the panelboard schedule, a coordinated selective scheme between the main circuit breaker and branch/feeder circuit breakers so that under fault conditions the branch/feeder circuit breaker clears the fault while the main circuit breaker remains closed.

D. Accessories.

1.4 OPERATION AND MAINTENANCE DATA

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver panelboards in factory-fabricated water-resistant wrapping..

B. Handle panelboards carefully to avoid damage to material components, enclosure and finish.

C. Store in a clean, dry space and protected from the weather.

1.6 EXTRA MATERIALS

A. Keys: Furnish two (2) keys for each panelboard to Owner.

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PART 2 - PRODUCTS

2.1 MAIN AND DISTRIBUTION PANELBOARDS

A. Panelboards: Circuit breaker type.

B. UL label “SUITABLE FOR USE AS SERVICE EQUIPMENT” where used as service equipment.

C. Enclosure: NEMA Type 1. Minimum cabinet size: 5-3/4 inches deep; 20 inches wide, with 5" minimum gutter space top and bottom. Constructed of galvanized code gauge steel.

D. Provide cabinet front with hinged door with flush lock. Front cover shall be hinged to allow access to wiring gutters without removal of panel trim. Hinged trim shall be held in place with screw fasteners. Finish in manufacturer's standard gray enamel.

E. Provide metal directory holders with clear plastic covers.

F. Provide panelboards with copper bus (phase buses, bus fingers, etc.), ratings as scheduled on Drawings. Provide ground bars in all panelboards. Neutral and ground bars can be dual rated ALCU9. All spaces shall have bus fully extended and drilled for the future installation of breakers.

G. Circuit breakers shall be 125 VDC/240 AC rated for nominal 208Y/120V panels and 480Y/277V rated for nominal 480Y/277V panels. Minimum interrupting ratings shall be 10,000 amperes for 120/208V circuits and 14,000 amperes for 277/480V circuits, unless higher rating noted on the Contract Documents.

H. Molded Case Circuit Breakers: Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits. Breakers 225 ampere through 400 ampere shall have continuously adjustable magnetic pick-ups of approximately five to ten times trip rating.

I. Circuit breakers shall be bolt-on type with common trip handle for all poles. No handle ties of any sort will be approved.

J. Ground fault breakers shall be provided where indicated.

2.2 BRANCH CIRCUIT PANELBOARDS

A. Lighting and Appliance Branch Circuit Panelboards: Circuit breaker type.

B. UL label “SUITABLE FOR USE AS SERVICE EQUIPMENT” where used as service equipment.

C. Enclosure: Type 1. Minimum cabinet size: 5-3/4 inches deep; 20 inches wide with 5" minimum gutter space top and bottom. Constructed of galvanized code gauge steel.

D. Provide surface cabinet fronts with concealed trim clamps, concealed hinge and flush cylinder lock all keyed alike. Front cover shall be hinged to allow access to wiring gutters without removal of panel trim. Hinged trim shall be held in place with screw fasteners. Finish in manufacturer's standard gray enamel.

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E. Provide flush cabinet fronts with concealed trim clamps, concealed hinge and flush cylinder lock all keyed alike. Finish in manufacturer's standard gray enamel.

F. Provide metal directory holders with clear plastic covers.

G. Provide panelboards with copper bus (phase buses, bus fingers, etc.), ratings as scheduled on Drawings. Provide ground bars in all panelboards. Neutral and ground bars can be dual rated ALCU9. All spaces shall have bus fully extended and drilled for the future installation of breakers.

H. Minimum System (i.e. individual component) Short Circuit Rating: As shown on the Drawings.

I. Molded Case Circuit Breakers: Bolt-on type thermal magnetic trip circuit breakers. Provide UL Class A ground fault interrupter circuit breakers where shown on Drawings. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits. Breakers 225 ampere through 400 ampere shall have continuously adjustable magnetic pick-ups of approximately five to ten times trip rating.

J. Do not use tandem circuit breakers.

K. Circuit breakers shall be bolt-on type with common trip handle for all poles. No handle ties of any sort will be approved.

L. Ground fault breakers shall be provided where indicated.

M. All of the panelboards provided under this section shall be by the same manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. See specification section 260529 Hangers and Supports.

B. Install panelboards plumb with wall finishes.

C. Height: 6 ft to top.

D. Install a crimp type stud termination to stranded conductor when terminating on circuit breakers without a captive assembly rated for terminating stranded conductors.

E. Provide filler plates for unused spaces in panelboards.

F. See specification section 260553 Identification. Provide typed circuit directory for each branch circuit panelboard. Circuit labels shall indicate actual loads served. Use final room numbers and names of equipment. Do not use panel directories used for construction purposes. Revise directory to reflect circuiting changes required to balance phase loads.

G. Provide ARC flash identification per NFPA 70E.

H. Stub five (5) empty 1” conduits to accessible location above ceiling or below floor out of each recessed panelboard. Cap these conduits to prevent material from entering them.

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I. Keep panel interior clean at all times.

J. Cabinet exteriors shall be maintained free of mud, spray-on insulation, paint spray and all substances not placed on the exterior surface by the panelboard manufacturer.

K. For panelboards located in areas accessible to the public, paint the exposed surfaces of the trims, doors, and boxes with finishes to match surrounding surfaces after the panelboards have been installed.

L. Panel cabinets shall not be used as raceways or pull boxes for adjacent equipment. Panel cabinets shall not contain wire splices. Panel wiring shall be installed in a neat and workmanlike manner with wire conforming to the contours of the cabinet. Wire bundles shall be wire tied and installed in a manner to protect wire insulation from cover screws and other sharp edges. All phase conductors shall be labeled with a circuit number, readily visible to the panelboard front without removing the dead front cover. All neutral conductors shall be labeled with the circuit number, which they are associated with, within three inches of their termination point

M. For circuit breakers being added to existing panelboards, coordinate the breaker type with existing panelboards. Modify the panel directory.

N. Where new panels are to be installed in existing backboxes, backboxes shall have rust and scale removed from inside. Paint inside of backboxes with rust preventive paint before the new panel interior is installed. Provide new trim and doors for these panels. Covers shall fit tight to the box with no gaps between the cover and the box.

3.2 FIELD QUALITY CONTROL

A. If aluminum conductors size #1/0 and larger (per specification section 260519 Low Voltage Electrical Power Conductors and Cable) are to be used as panelboard feeders, it is the responsibility of the contractor to provide panelboards with adequate wire bending space to accommodate the aluminum conductors and terminators to meet allowable code requirements.

B. The Contractor shall circuit the panelboards as shown on the drawings. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 10 percent, rearrange circuits in the panelboard to balance the phase loads within 10 percent.

C. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections.

END OF SECTION

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SECTION 262702
EQUIPMENT WIRING

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the electrical connections indicated by the Contract Documents with supplementary items necessary for proper installation.

B. Equipment included in this Section may be specified under other Divisions and/or Sections, or furnished by Owner, including, but not limited to:

1. HVAC motors, VFDs, and panels

2. Plumbing motors, VFDs, and panels

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

B. Section 260533 Raceway and Boxes for Electrical Systems.

C. Section 260519 Low-Voltage Electrical Power Conductors and Cables.

1.3 COORDINATION

A. Coordinate all equipment requirements with the various contractors and the Owner. Review the complete set of drawings and specifications to determine the extent of wiring, starters, devices, etc., required.

PART 2 - PRODUCTS

2.1 CORDS AND CAPS

A. Straight-blade Attachment Plug: NEMA WD 1.

B. Locking-blade Attachment Plug: NEMA WD 5.

C. Attachment Plug Configuration: Match receptacle configuration at outlet provided for equipment.

D. Cord Construction: Oil-resistant thermoset insulated multiconductor flexible cord with identified equipment grounding conductor, suitable for hard usage in damp locations.

E. Cord Size: Suitable for connected load of equipment and rating of branch circuit overcurrent protection.

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2.2 OTHER PRODUCTS

A. Refer to related sections for other product requirements.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.2 PREPARATION

A. Review equipment submittals prior to installation and electrical rough-in. Verify location, size, and type of connections. Coordinate details of equipment connections with supplier and installer.

3.3 INSTALLATION

A. Use wire and cable with insulation suitable for temperatures encountered in heat-producing equipment.

B. Make conduit connections to equipment using flexible PVC-coated metal conduit.

C. Install pre-finished cord set where connection with attachment plug is indicated or specified, or use attachment plug with suitable strain-relief clamps.

D. Provide suitable strain-relief clamps for cord connections to outlet boxes and equipment connection boxes.

E. Make wiring connections in control panel or in wiring compartment of pre-wired equipment in accordance with manufacturer's instructions. Provide interconnecting wiring where indicated.

F. Install disconnect switches, controllers, control stations, and control devices such as limit switches and temperature switches as indicated. Connect with conduit and wiring as indicated.

G. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

3.4 EQUIPMENT CONNECTION SCHEDULE

A. As indicated on the drawings.

END OF SECTION

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SECTION 262713
ELECTRICITY METERING

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the utility metering requirements as well as metering/monitoring equipment for the Owner's use indicated by the Contract Documents with supplementary items necessary for proper installation.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Receive, store, and handle modular meter center according to NECA 400.

1.5 COORDINATION

A. Electrical Service Connections: Coordinate with utility companies and components they furnish as follows:

1. Comply with requirements of utilities providing electrical power services.

2. Coordinate installation and connection of utilities and services, including provision for electricity-metering components.

PART 2 - PRODUCTS

2.1 EQUIPMENT FOR ELECTRICITY METERING BY UTILITY COMPANY

A. The following will be furnished by utility company:

1. Meter

2. Primary service including conduits where required (above and beyond conduit stubs installed by the Contractor).

3. Pad-mounted utility transformer

4. Primary and secondary terminations at the utility transformer.

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B. Current-Transformer Cabinets: Comply with requirements of electrical-power utility company.

C. Meter Sockets: Comply with requirements of electrical-power utility company.

D. Meter Sockets: Steady-state and short-circuit current ratings shall meet indicated circuit ratings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with equipment installation requirements in NECA 1.

B. Contact Utility Company and make arrangements to obtain permanent electric service to the Project.

C. Utility transformer pad shall be furnished and installed by the General Contractor to utility company's specifications.

D. Install meters furnished by utility company. Install raceways and equipment according to utility company's written requirements. Provide empty conduits for primary cabling, metering leads and extend grounding connections as required by utility company.

3.2 IDENTIFICATION

A. Comply with requirements for identification specified in specification section 260553 Identification for Electrical Systems.

1. Series Combination Warning Label: Self-adhesive type, with text as required by NFPA 70.

2. Equipment Identification Labels: Adhesive film labels with clear protective overlay. For residential meters, provide an additional card holder suitable for printed, weather-resistant card typewritten card with occupant's name.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections

1. Connect a load of known kilowatt rating, 1.5 kW minimum, to a circuit supplied by metered feeder.

2. Turn off circuits supplied by metered feeder and secure them in off condition.

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3. Run test load continuously for eight hours minimum, or longer, to obtain a measurable meter indication. Use test-load placement and setting that ensures continuous, safe operation.

4. Check and record meter reading at end of test period and compare with actual electricity used, based on test-load rating, duration of test, and sample measurements of supply voltage at test-load connection. Record test results.

C. Electricity metering will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION

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SECTION 262726
WIRING DEVICES

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install the following wiring devices indicated by the Contract Documents with supplementary items necessary for proper installation.

B. Equipment included in this Section

1. Wall switches
2. Receptacles
3. Device plates and box covers
4. Photo cells
5. Time clocks

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

1.3 SUBMITTALS

A. Provide product data showing model numbers, configurations, finishes, dimensions, and manufacturer's instructions.

1.4 OPERATION AND MAINTENANCE DATA

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials shall meet or exceed all applicable referenced standards, federal, state, and local requirements, and shall conform to codes and ordinances of authorities having jurisdiction.

B. Provide factory fabricated wiring devices in the type and electrical rating for the service indicated. Where type and grade are not indicated provide proper selection to correspond with branch circuit wiring and overcurrent protection.

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C. Attachment of wires to devices shall be by screw pressure under the head of binding screws. Arrangements depending on spring pressure or tension are not acceptable. All binding screws shall be brass or bronze.

D. See Drawings for Device Schedule.

2.2 DEVICE COLOR

A. White, unless noted otherwise.

2.3 WALL SWITCHES

A. Wall Switches for Lighting Circuits and Motor Loads Under 1/2 HP: Quiet-type single pole through four (4)-way.

B. Heavy duty use toggle switch, nylon or high impact resistant face and body, rated 20 amperes and 120/277 volts AC.

C. Switches shall be UL20 Listed and meet Federal Specification WS-896. All switches shall be heavy duty Specification Grade with separate green ground screw.

D. All switches shall be back and side wired, screw clamp type, suitable for solid or stranded wire up to #10 AWG.

2.4 STRAIGHT-BLADE RECEPTACLES

A. Nylon or high impact resistant face, NEMA configuration as scheduled on the Drawings.

B. Receptacles shall be UL498 Listed and meet Federal Specification WC-596.

C. All receptacles shall be back and side wired, screw clamp type, suitable for solid or stranded wire up to #10 AWG, with a separate green ground screw. Connector-type receptacles are also acceptable.

2.5 GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RECEPTACLES

A. Duplex convenience receptacle, Specification Grade, with integral ground fault current interrupter, auto monitoring (self-test), and line-load reversal function meeting the requirements of UL standard 943 Class A and UL standard 498.

B. All receptacles installed in outdoor locations, in garages, within six (6) feet of the outside edge of sinks, and in other damp or wet locations shall be GFCI type.

2.6 SPECIFIC USE RECEPTACLE

A. Configuration: As indicated on drawings.

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2.7 DEVICE PLATES AND BOX COVERS

A. Cover Plate

1. Finished Spaces: Smooth thermoplastic nylon.

2. Unfinished Spaces: Smooth thermoplastic nylon.

3. Mechanical and Electrical Rooms: Smooth thermoplastic nylon.

B. Weatherproof Cover Plate: Gasketed plastic with hinged cover, wet location listed while in use.

2.8 PHOTO CELLS

A. The controller shall be rated 2000 watts tungsten at 120, 240 or 277 volts. The cell shall be cadmium sulfide, 1" diameter.

B. The enclosure shall be die cast zinc, gasketed for maximum weather proofing.

C. The enclosure shall include the positioning lug on the top of the enclosure.

D. The unit shall have a delay of up to two (2) minutes to prevent false switching. ON/Off adjustment shall be done by moving a light selector with a range from two (2) to fifty (50) foot-candles.

E. Mounting shall be for a 1/2" conduit nipple.

F. The unit shall have a five (5) year warranty.

G. The contacts shall be SPST normally closed.

H. The operational temperature range shall be -40 to 140° F.

2.9 TIME CLOCKS

A. Unit shall be a multi-purpose, seven (7) day, 365 day advance single, and skip a day, combination two (2)-channel electronic time clock with a SPDT switching configuration and astronomic dial.

B. The contacts shall be rated 30 amp resistive at 120/250 VAC, 7.5 amps inductive at 120/240 VAC, 5 amps inductive at 30 VDC and up to 1/2 hp at 250 VAC. The unit shall be rate for 30 VDC, 120 VAC, 250 VAC and 277 VAC.

C. The controller shall be capable of programming in the AM/PM or 24 hour format by jumper selection, in one (1) minute resolution, using two (2) buttons only for all basic settings.

D. Display shall be LED type.

E. The unit shall have 365 day and or holiday selection capabilities, with sixteen (16) single date and five (5) holiday selection options and user selectable daylight savings/standard time functions.

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F. The unit shall have 72 hour memory backup with rechargeable battery and charger.

G. The unit shall be capable of manual override, On and OFF to the next scheduled event, using one (1) button for each channel.

H. The enclosure shall be rated for indoor or outdoor installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All dimensions noted are centerline dimensions.

B. Install wall switches 42 inches above floor, OFF position down.

C. Install wall dimmers 42 inches above floor; de-rate ganged dimmers as instructed by manufacturer; do not use common neutral.

D. Install convenience receptacles 18 inches above floor, 6 inches above counters or backsplash, grounding pole on bottom. Mount horizontally where indicated.

E. Install boxes for information outlets 18 inches above finished floor.

F. Install specific-use receptacles at heights shown on Contract Drawings.

G. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

H. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.

I. Install devices and wall plates flush and level.

J. Receptacles shall have a bonding conductor from grounding terminal to the metal conduit system. Self-grounding receptacles using mounting screws as bonding means are not approved.

3.2 FIELD QUALITY CONTROL

A. Inspect each wiring device for defects.

B. Operate each wall switch with circuit energized and verify proper operation.

C. Verify that each receptacle device is energized.

D. Test each receptacle device for proper polarity.

E. Test each GFCI receptacle device for proper operation.

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3.3 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

B. Mark all conductors with the panel and circuit number serving the device with a machine generated label, at the device, and on the back of the device cover.

END OF SECTION

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SECTION 262728
DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install disconnect switches, fuses and enclosures indicated by the Contract Documents with supplementary items necessary for proper installation.

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

1.3 SUBMITTALS

A. Include outline drawings with dimensions, and equipment ratings for voltage, ampacity, horsepower, and short circuit.

1.4 OPERATION AND MAINTENANCE DATA

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

PART 2 - PRODUCTS

2.1 DISCONNECT SWITCHES

A. Fusible Switch Assemblies (use only when overcurrent protection is required): NEMA Type Heavy Duty; quick-make, quick-break, load interrupter, enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse Clips: designed to accommodate Class R cartridge type fuses.

B. Nonfusible Switch Assemblies: NEMA Type Heavy Duty; quick-make, quick-break, load interrupter, enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

C. Provide auxiliary contacts on fusible switches serving elevator controllers.

D. Solid neutral bus when neutral conductor is included with circuit.

E. Provide manufacturer's equipment ground kit in all disconnect switches.

F. Enclosure: NEMA Type as indicated on Drawings.

G. Current rating and number of poles as indicated on drawings.

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2.2 FUSES

A. Fuses 600 Amperes and Less: Dual element, time delay, 250 volt, UL Class RK 1. Interrupting Rating: 200,000 rms amperes.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install disconnect switches where indicated on Drawings.

B. Install switches so that the maximum height above the floor to the center of the operating handle does not exceed 6'-6".

C. Provide conduit and wiring from the auxiliary contacts on the elevator disconnect switch to the elevator controller. Coordinate installation with the elevator vendor.

D. Provide identification as specified in Section 260553.

END OF SECTION

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SECTION 265629
SITE LIGHTING

PART 1 - GENERAL

1.1 SCOPE

A. Perform all Work required to provide and install site lighting indicated by the Contract Documents with supplementary items necessary for proper installation.

B. Equipment included in this Section

1. Exterior luminaires and accessories

2. Poles

3. Foundations

1.2 REFERENCES

A. Applicable provisions of Division 1 govern work under this Section.

1.3 SUBMITTALS

A. Shop Drawings: Indicate dimensions and components for each luminaire, pole and base.

B. Product Data: Provide dimensions, ratings, performance data, lamp and ballast data, weights and accessory information for each type.

C. Manufacturer's Instructions:

1. Indicate application conditions and limitations of use stipulated by product testing agency specified under "Regulatory Requirements".

2. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

1.4 PROJECT RECORD DOCUMENTS

A. Accurately record actual locations of each luminaire, pole and underground circuit.

1.5 OPERATION AND MAINTENANCE DATA

A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

1.6 COORDINATION

A. Use bolt templates and pole mounting accessories to install anchor bolts in pole base.

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1.7 WARRANTY

A. All equipment shall be warranted to be free of defects in materials and workmanship by the manufacturer for the time period listed below from the date of project substantial completion:

1. LED luminaires (including LED power supply): Five (5) years

2. Pole (including pole finish): Five (5) years

PART 2 - PRODUCTS

2.1 LUMINAIRES

A. Furnish products as specified in schedule on Drawings.

2.2 LAMPS

A. Provide lamp type specified for luminaire.

B. LED: Provide with integral surge protection. See schedule.

C. All lamps shall be new and by the same manufacturer.

2.3 FUSES

A. Furnish and install a fuse holder and fuse in each ungrounded leg of the electrical circuit supplying the outdoor luminaire. Every luminaire shall be separately fused with a waterproof fuse holder. Size the fuse for the amperage of the luminaire. Tap the circuit conductors with a minimum #10 AWG conductor to serve the luminaire. The fuse and holder shall be accessible through the handhole. Provide sufficient wire to bring fuse holder outside of handhole.

2.4 POLES

A. Furnish products as specified in schedule on Drawings.

B. Handhole: With removable weatherproof cover.

C. Anchor Bolts: As recommended by pole manufacturer. Provide template, flat washers, lock washers, and hex nuts for each pole.

2.5 POLE FOUNDATIONS

A. Construct from reinforced concrete in sizes as shown on drawings and to meet the minimum structural requirements of the site soil conditions.

B. Provide 3/4" X 10'0" ground rod in the pole foundation so that the ground rod projects 3" up into center of pole base.

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C. The exposed surface area of the foundation shall have the forms removed and the concrete rubbed out to a smooth finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturers' instructions.

B. Minimum underground conduit size is 1 inch.

C. Underground and exterior wire shall be type XHHW-2.

D. Project anchor bolts 2 inches minimum above base.

E. Install all anchor bolts and handhole fasteners with anti-seize compound.

F. Install poles plumb. Provide shims or double nuts to adjust plumb.

G. Use belt slings or non-chafing ropes to raise and set pre-finished luminaire poles.

H. Bond each luminaire, each metal accessory, the ground rod and the pole to the branch circuit equipment ground conductor with a separate ground wire sized per NEC or as shown on the drawings.

3.2 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for improper connections and operation.

3.3 ADJUSTING

A. Aim and adjust luminaires as indicated on Drawings or as directed by the A/E.

B. All new lamps shall be operational at the Substantial Completion of the project.

3.4 CLEANING

A. Clean photometric control surfaces.

B. Clean finishes and touch up damage.

END OF SECTION

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July 3, 2024

Project No: 242048MWP

Bolton and Menk
Attn: Mrs. Brianna Hanke, PLA
430 E. Grand Ave, Suite 101
Des Moines, Iowa 50309

Re: **Geotechnical Investigation Executive Summary**
Marshalltown Water Plaza – Mega 10 Park
Marshalltown, Iowa

Dear Mrs. Hanke:

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 cohesive alluvium soil and granular alluvium sands deposits, classified as CL and SP soils. The natural, on-site soils are non-expansive by nature. These types of soils are 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.
- The on-site sands are very sensitive to moisture content fluctuations. This will 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.
- Groundwater was noted during drilling operations, ranging from 14-17 feet below existing grades. Dewatering techniques may become necessary during construction as these levels will fluctuate with seasonal changes and grading operations.
- Bearing capacity of the soils were moderate for the proposed structures. Foundations should be designed for values of 2,000 psf for continuous footings and 2,500 psf for isolated column pads. This can be enhanced, if desired. It is likely these values could fluctuate between the time of drilling and the time of foundation installation, due to changes in final elevations, groundwater levels, etc.
- **Sand seams and/or soil layers that change moisture content dramatically tend to consolidate during drier seasons. This process will encourage settlement and/or differential settlement. It is imperative that the structural design engineer understands the possibility of these occurrences at this site and takes them into consideration during the design phase.**
- 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 4 inch pavement section. The pavement sections should be increased in thickness for areas receiving higher traffic loads, such as service vehicle approaches (i.e. trash enclousres), or existing tie-ins.

Please feel free to call should you have questions or if we may be of further assistance.

Sincerely,

Sybil K. Ferrier, P.E.
Principal Engineer

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www.cmt-iowa.com

GEOTECHNICAL INVESTIGATION

FOR

MARSHALLTOWN WATER PLAZA

MEGA 10 PARK

MARSHALLTOWN, IOWA

PROJECT NO. 242048MWP

Prepared For:

Bolton and Menk, Inc
Attn: Mrs. Brianna Hanke, PLA
430 E. Grand Ave, Suite 101
Des Moines, IA 50309

Prepared By:

Construction Materials Testing, Inc.
1610 E. Madison Avenue
Des Moines, IA 50313

July 3, 2024

LICENSED PROFESSIONAL ENGINEER SYBIL K., FERRIER, 20479 IOWA	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. 7/3/24 Sybil K. Ferrier, P.E. Date License No. 20479 My License renewal date is **December 31,** 2024. Pages or sheets covered by this seal: All Pages.

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GEOTECHNICAL ENGINEERING REPORT

Marshalltown Water Plaza

Mega 10 Park

Marshalltown, Iowa

July 3, 2024

Project No. 242048MWP

PROJECT BACKGROUND

Bolton and Menk Engineers (BMI) are assisting the City of Marshalltown with renovating Mega 10 Park along the west side of the city. The renovations will add a restroom facility, in addition to a sculpture for viewing in the park. It is anticipated that minor site grading on the order of 2 feet or less will be required across the site to establish final grades.

Five borings were conducted across the site to evaluate soil conditions for the proposed addition. 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 construction of the park renovations.

FIELD EXPLORATION

Field exploration was conducted on June 20, 2024. The boring locations were selected and staked in the field by BMI. No topographic site information was available at the time this report was issued. 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 on the west side of Marshalltown, Iowa. 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:

Topsoil – Topsoil was present to a depth of 2 to 3 feet below existing grade in all borings. The average depth of topsoil was noted to be 24 inches. The topsoil consisted of dark brown sandy lean clay (CL) with traces of organics. The organic zone of the topsoil was observed to be near 8-10 inches thickness and it was present in a moist condition at the time of drilling.

Cohesive Alluvium – Cohesive alluvium was the predominate soil type found at this site. It was generally encountered beneath the topsoil in the bores. It was comprised of various shades of brown-dark brown, brown-light brown, and dark brown-brown sandy lean clay (CL). The deeper stratum of cohesive alluvium was comprised of dark gray-gray and very dark gray sandy to very sandy lean clay (CL). The alluvium exhibited soft to medium stiff consistencies in a moist to very moist condition. This soil stratum was encountered to depths ranging from to 15 to 18 feet below existing grades in Boring Nos. 3 through 5. Boring Nos. 1 and 2 terminated in this soil stratum at a depth of 20 feet below existing grades.

Granular Alluvium – Granular alluvium sands were encountered beneath the cohesive alluvium in Boring Nos. 3 through 5. This soil stratum consisted of gray fine to medium sands (SP). The granular alluvium exhibited loose to medium dense consistencies in a very moist to wet condition. Boring Nos. 3 through 5 terminated in this soil stratum at depths of 20 feet below existing grades.

Groundwater Observations

Groundwater accumulation was noted during drilling operations, varying in depth from 14 to 17 feet below existing grades. The average depth of groundwater was noted to be 15 feet below existing grades. No additional moisture seepage was noted during drilling operations. It should be anticipated the groundwater levels will fluctuate from the observed values at drilling to the time of construction, especially since this site is adjacent to a local waterway. Dewatering techniques may become necessary during construction if these levels rise, especially due to the proximity to a local waterway. Fluctuations in groundwater can occur from varying amounts of precipitation, changes in surface coverage (i.e. adding pavements or vegetation), irrigation practices, etc. Brown-gray coloring of the soil is another indication of potential groundwater levels. The color change of the soil will indicate a level at which the groundwater is fluctuating. 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. The groundwater levels observed during site exploration can be seen on the attached Boring Logs in the appendix.

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

Site Preparation

Site preparation will begin with the stripping of any organic or loose material present near the surface, such as the existing organic zone of the topsoil. This could be on the order of 12 inches or less across the site. The topsoil should be stockpiled for use to re-dress the landscaping after construction operations are completed. It is anticipated that minor grubbing operations will also be necessary. If encountered, any mature vegetation, roots, or other large areas of organic materials, or unforeseen debris 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 above to well above (+3-5%) 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.

Earthwork Considerations

It is anticipated that minor site grading, on the order of 2 feet or less, will be required to achieve the desired final grades across this site. The on-site natural soils would be suitable for general grading applications and were deemed non-expansive. Sand seams and layers were noted during drilling operations. These areas are easily disturbed by construction traffic, due to their lack of cohesion. In addition, alluvial soils can lack cohesion, if the silt content is high enough. After these soils are disturbed, re-stabilizing them can become difficult. Tracked end loader equipment can be the most detrimental to the bearing conditions of the sands.

It is recommended for any fill or off-site borrow material needed for site grading consist of a non-expansive (CL) cohesive material, free of organics and rubble, or a granular material. The 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. The non-expansive cohesive fill material should exhibit a Liquid Limit less than 45 and a Plasticity Index less than 23 when tested in compliance with ASTM D-4318. All fill materials, cohesive or granular, should be pre-approved prior to placement.

The alluvial soils have a characteristically high sand and silt contents and the cohesive layers were noted to contain sand seams or sand pockets. These soil types will not support trenching operations if encountered at very high moisture contents, due to the lack of cohesion within the sands. When areas of increased sand or silt are encountered during construction, they

could cave or collapse rapidly, due to lack of cohesion and support. This is especially dangerous 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.

CMT has not been provided with information regarding specific design or construction plans; therefore, we cannot address more specific earthwork issues at this time. If desired, CMT can review a final grading plan when it becomes available to insure compatibility with geotechnical recommendations. We recommend for CMT personnel be on-site during construction to verify compaction, bearing capacity or material suitability during the construction process.

Foundation Design

The natural soils present near typical frost depth foundation level exhibited adequate bearing capacities for the proposed structures. It is recommended for foundation soils to be verified at the time of construction since groundwater conditions and site topography will likely change. It is recommended for foundations placed on natural soils (non-fill soils) to be designed for a maximum net soil bearing pressure of 2,000 pounds per square foot for continuous foundations and 2,500 pounds per square foot for isolated column loads. It is estimated for long-term settlements induced from structural loads to be on the order of one inch or less. Differential settlements of approximately ½ of the total settlement can occur from variations in foundation loading and subsurface conditions.

Sand seams and/or soil layers that change moisture content dramatically tend to consolidate during drier seasons. This process will encourage settlement and/or differential settlement. It is imperative the structural design engineer understands the possibility of these occurrences at this site and takes them into consideration during the design phase.

If unsuitable soil conditions (i.e. wet or expansive) are encountered, an over-excavation and backfill procedure should be implemented. **This remedial technique should be evaluated as needed, as soil conditions will change after site grading is complete, and after consultation with the structural and geotechnical engineers of record.** The over-excavation should be conducted to a depth of three feet below final foundation elevations. The area should then be backfilled with a non-expansive lean clay (CL) or a granular material, such as a maximum size one inch clean limestone. Non-expansive clay is one that exhibits a Liquid Limit of 45 or less and a Plasticity Index of 23 or less when tested in compliance with ASTM D-4318 (Atterberg Limits Test). Over-excavated foundations can be designed for 3,000 pounds per square foot for continuous foundations and 3,500 pounds per square foot for isolated column pads. It is estimated that long-term settlements induced from structural loads to be on the order of one inch or less with an over-excavation process. Differential settlements of approximately ½ of the total settlement can occur from variations in foundation loading and subsurface conditions.

Surface water runoff, as well as seasonal fluctuations, can also become detrimental to soil conditions over time. It is encouraged for interior and exterior foundation drainlines to be installed to minimize the possibility of this damage. These drainlines are a small investment at the time of construction and will aid in maintaining soil moisture contents, thus stabilizing soil bearing capacities. The drainlines could consist of 4 inch perforated PVC or similar material and should be backfilled with a free draining granular material, such as pea gravel or coarse sand. The drain lines should be constructed to daylight away from the structure or to a suitable outlet for disposal, such as sump pumps or storm drains. Any drainlines should be daylighted a minimum of 20 feet from building foundations.

A CMT representative should observe and probe foundation excavations to ensure that soils are suitable for concrete and steel placement. To prevent the softening of subgrade soils, foundation excavations should be kept free of water

accumulation prior to concrete placement. All exterior footings and foundations in unheated areas should be placed a minimum of 3.5 feet (frost depth) below grades to provide adequate frost protection.

Wall Design Parameters

Retaining walls, structural walls, or any walls which are constructed to retain soils should be designed to restrain unbalanced lateral earth pressures. Earth pressures can be influenced by groundwater, construction methods, backfill compaction techniques, soil strength and wall restraining conditions. Basement walls constructed with reinforced concrete should be designed for lateral earth pressures at least equal to those indicated in the following table.

LATERAL EARTH PRESSURE COEFFICIENTS

Condition[1]	**Cohesive Soil****	**Granular Soils**
Approximate Friction Angle	15° - 20°	30° – 35°
Approximate Total Density	130 pcf	120 pcf
At-Rest Pressure Coefficient, K_o	0.7	0.5
Passive Pressure Coefficient, K_p	2.0	3.3
Active Pressures Coefficient, K_a	0.5	0.3
Estimated Lateral Earth Pressure[2] (Equivalent Fluid Pressures)		
At-Rest – Drained At-Rest – Undrained[3]	90 pcf 110 pcf	60 pcf 90 pcf
Passive – Drained Passive – Undrained[4]	260 pcf 135 pcf	400 pcf 190 pcf
Active – Drained Active – Undrained[3]	65 pcf 95 pcf	35 pcf 80 pcf

*Non-expansive clay materials
[1]Assumed Backfill Characteristics
[2] Assumes negligible wall friction, no safety factor, level backfill, vertical wall, zero surcharge loads and no cohesion shear strength.
[3] Combined hydrostatic (water 62.4 pcf) loading and buoyant backfill unit weight.
[4] Omits hydrostatic loading.

Active earth pressure design assumes the wall can deflect and rotate about its top axis. If the wall is rigidly fixed, higher lateral earth pressures will develop against the wall and at-rest pressure parameters should be utilized for design purposes. Increased earth pressures can occur from surcharge loads adjacent to the wall, limited soil drainage, and compaction of the wall backfill. Expansive cohesive materials (CL-CH) should not be present naturally or placed as backfill within 3 feet of below grade walls. If a granular material is used as wall backfill, the backfill should have a minimum width of 2 feet and be wide enough to allow for a minimum back slope of 2:1 (horizontal: vertical) or flatter.

Walls retaining fine grained soils and subjected to seasonal temperatures may experience long term accumulative movements due to freeze-thaw action and soil creeping. It is recommended that wall backfill consist of a free-draining granular material to reduce this movement and that it be placed directly against the wall. The granular material should consist of a clean granular material, such as IDOT Specification 4131, and connect to a suitable drainage system.

Exterior Pavement Support and Design Considerations

The on-site natural soils are suitable for pavement subgrade preparation. 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 (due to wet soil conditions), chemically stabilizing the subgrade may be done with cement, or fly ash. 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.

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, CMT recommends a 4 inch thick PCC pavement consisting of 4,000 psi compressive strength mix with a 6 percent entrained air content for a pavement section. If a HMA pavement is considered, CMT recommends a 300,000 ESAL (HT) mix for each lift. The lifts should consist of 2 inches of ¾ inch base mix and 2 inches of ½ inch surface mix. The pavement sections should be increased in thickness for areas receiving higher traffic loads, such as service vehicle approaches (i.e trash dumpsters) or existing tie ins.

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 (but not necessarily warranted at this site due to deeper groundwater levels), 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. 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 sandy clays and sand deposits. 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 developer 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

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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 Organic Clay	Pt	Peat
SC	Clayey Sand	GC	Clayey Gravel				

RELATIVE DENSITY OF COARSE-GRANED 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)			

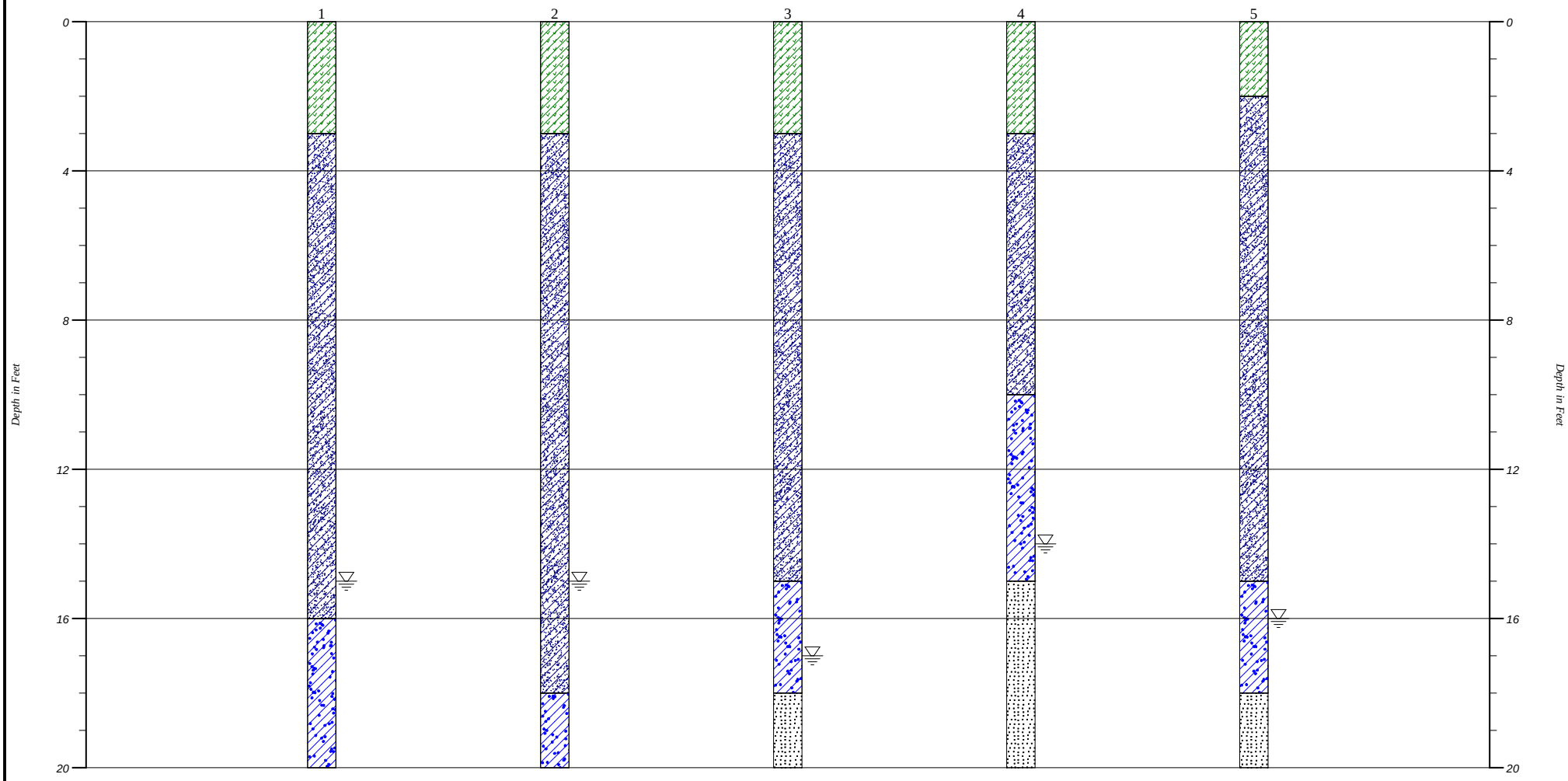
DRILLING AND SAMPLING ABBREVIATIONS

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).



Strata symbols

- Topsoil
- Sandy lean clay
- Sandy lean clay
- Poorly graded sand

CONSTRUCTION MATERIALS TESTING GENERALIZED SOIL PROFILE		
HORIZONTAL SCALE:	DRAWN BY/APPROVED BY	DATE DRAWN
VERTICAL SCALE: 1"=4'		7/3/2024
Marshalltown Water Plaza Mega 10 Park		
PROJECT NO. 242048MWP		FIGURE NUMBER

Project	**Marshalltown Water Plaza Mega 10 Park**
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** * * The stratification lines represent approximate boundary lines between material types -- the transition may be gradual.	USCS	Water Level
0								Dark brown silty lean lcya, trace organcis, moist TOPSOIL	CL	
								Brown-dark brown sandy lean clay, moist to very moist	CL	
4	1	CS		16.9		2,5000**				
8	2	CS		22.7		2,000**		COHESIVE ALLUVIUM Gray-brown after 10 ft.		
12	3	CS		23.4		2,000**				
								Groundwater noted near 15 ft during drilling operations. Sand seam noted near 15 feet.		
16								Gray very sandy lean clay, very moist COHESIVE ALLUVIUM	CL	
	4	CS		24.6		1,500**				
20								End of Boring **Estimated using calibrated peneterometer.		
24										

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Project Marshalltown Water Plaza
Mega 10 Park

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								Dark brown silty lean lcya, trace organcis, moist TOPSOIL	CL	
								Brown-light brown sandy lean clay, moist	CL	
4	1	SS	11	16.1		3,000**				
8	2	SS	10	20.2		2,500**		Increasing sand content after 10 ft. COHESIVE ALLUVIUM		
12	3	SS	4	23.3		500**		Groundwater noted near 15 ft during drilling operations.		
16										
								Gray very sandy lean clay, moist to wet COHESIVE ALLUVIUM	CL	
20	4	SS	6	27.9		1,500**				
								End of Boring **Estimated using calibrated peneterometer.		
24										

* The stratification lines represent approximate boundary lines between material types -- the transition may be gradual.

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Project Marshalltown Water Plaza
Mega 10 Park

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								Dark brown silty lean lcya, trace organcis, moist TOPSOIL	CL	
								Dark brown-brown sandy lean clay, moist to very moist	CL	
4	1	CS		21.1		2,000**				
								Dark gray after 5 ft.		
8										
	2	CS		20.6		2,000**		COHESIVE ALLUVIUM		
12										
	3	CS		24.5		1,500**				
								Very dark gray very sandy lean clay, very moist Groundwater noted near 15 ft during drilling operations. COHESIVE ALLUVIUM	CL	
16										▽
								Gray fine to medium sand, wet GRANULAR ALLUVIUM	SP	
	4	CS		25.7		1,500**				
20								End of Boring **Estimated using calibrated peneterometer.		
24										

* The stratification lines represent approximate boundary lines between material types -- the transition may be gradual.

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Project Marshalltown Water Plaza
Mega 10 Park

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								Dark brown silty lean lcya, trace organcis, moist TOPSOIL	CL	
4	1	CS		16.1		2,500**		Dark brown-brown sandy lean clay, moist COHESIVE ALLUVIUM	CL	
8	2	CS		21.9		2,000**				
12	3	CS		20.8		2,000**		Dark gray very sandy lean clay, moist COHESIVE ALLUVIUM Groundwater noted near 14 ft during drilling operations.	CL	
16	4	CS		24.5		1,500**		Gray fine to medium sand, wet GRANULAR ALLUVIUM	SP	
20								End of Boring **Estimated using calibrated peneterometer.		
24										

* The stratification lines represent approximate boundary lines between material types -- the transition may be gradual.

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Project Marshalltown Water Plaza
Mega 10 Park

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 * * The stratification lines represent approximate boundary lines between material types -- the transition may be gradual.	USCS	Water Level
0								Dark brown silty lean lcya, trace organcis, moist TOPSOIL	CL	
								Dark brown-brown sandy lean clay, moist	CL	
4	1	SS	9	16.4		2,000**				
8	2	SS	11	20.3		2,500**		COHESIVE ALLUVIUM Brown-light brown after 10 ft.		
12	3	SS	9	16.7		2,000**				
16								Gray very sandy lean clay, moist Groundwater noted near 16 ft during drilling operations. COHESIVE ALLUVIUM	CL	▽
	4	SS	3	22.1		500**		Gray fine to medium sand, very moist GRANULAR ALLUVIUM	SP	
20								End of Boring **Estimated using calibrated peneterometer.		
24										

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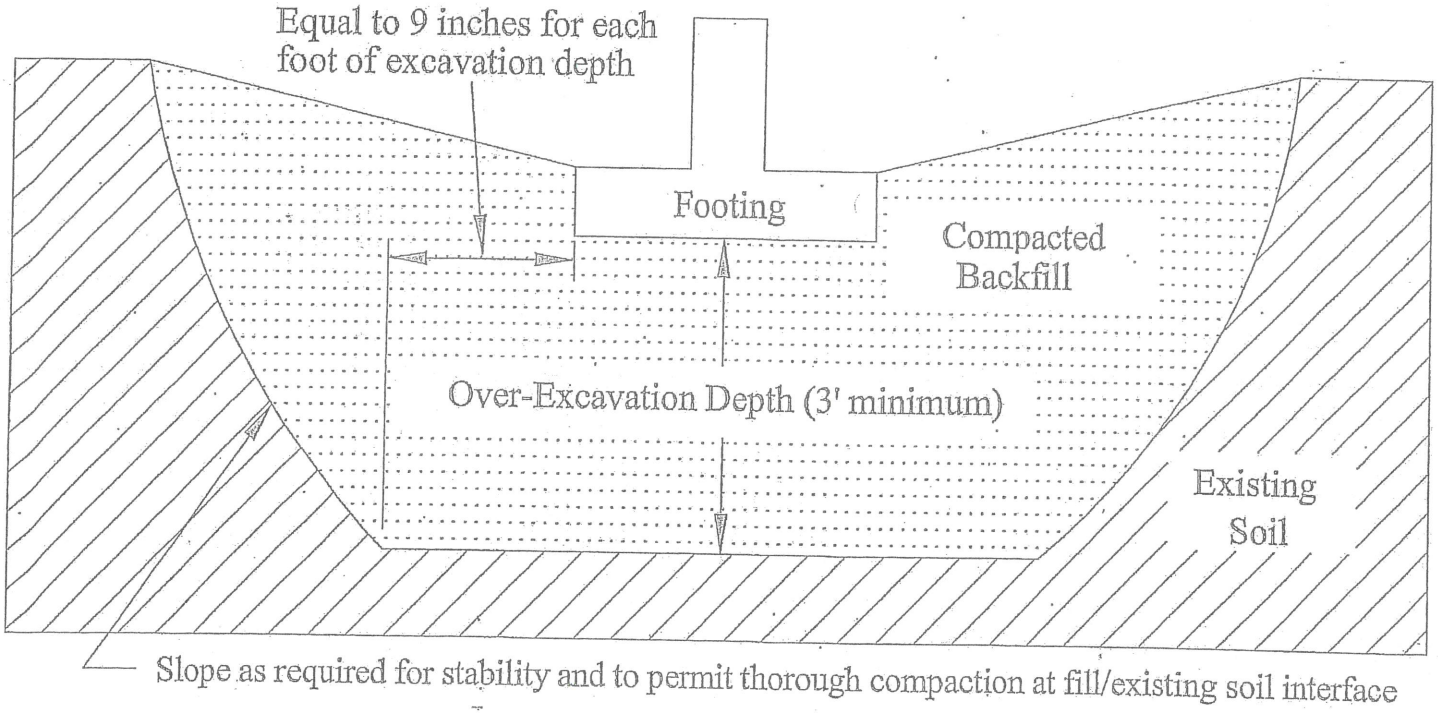
Construction Materials Testing

TYPICAL FOUNDATION OVER-EXCAVATION



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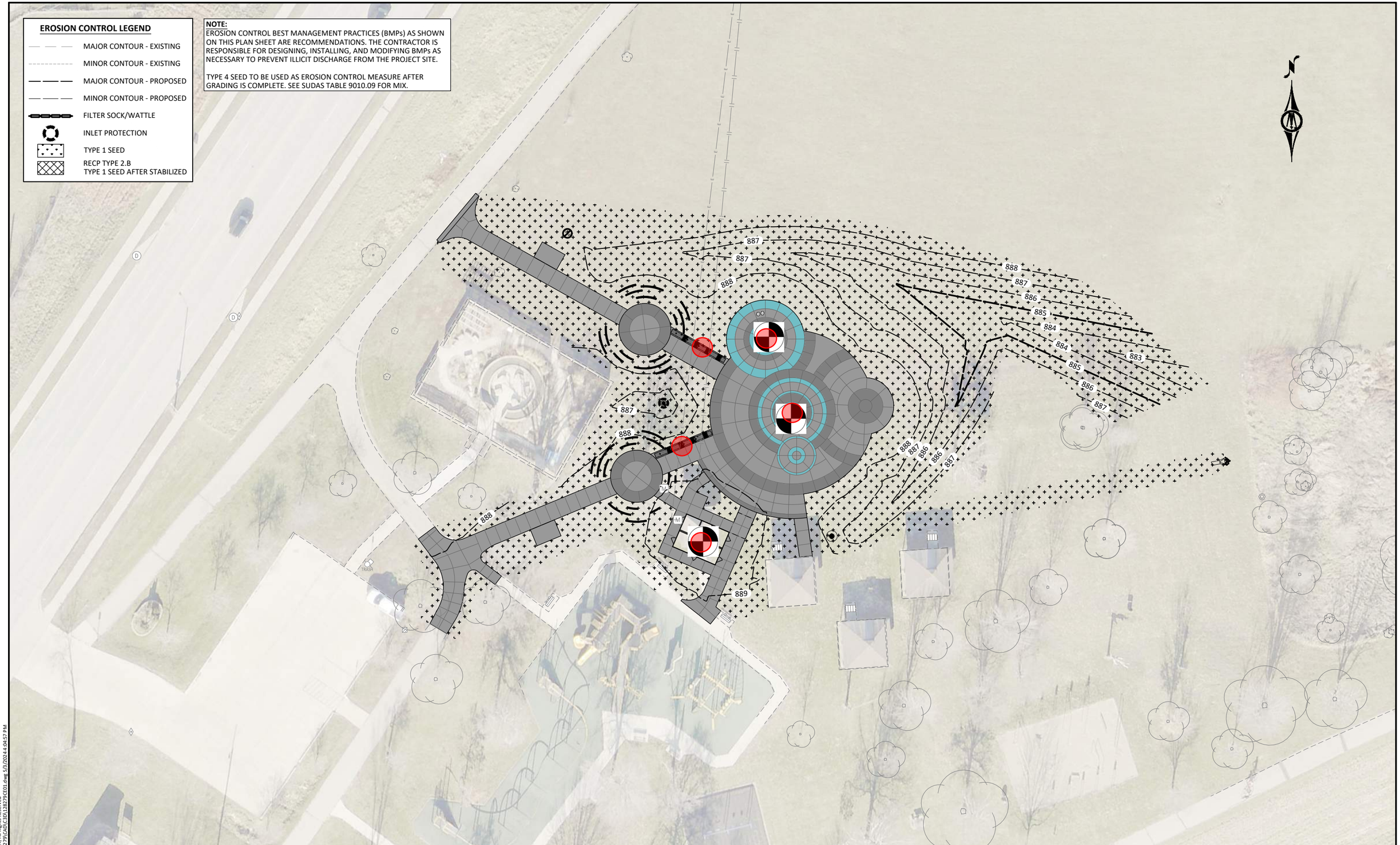
EROSION CONTROL LEGEND

- MAJOR CONTOUR - EXISTING
- MINOR CONTOUR - EXISTING
- MAJOR CONTOUR - PROPOSED
- MINOR CONTOUR - PROPOSED
- FILTER SOCK/WATTLE
- INLET PROTECTION
- TYPE 1 SEED
- RECP TYPE 2.B
  TYPE 1 SEED AFTER STABILIZED

NOTE:
EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPs) AS SHOWN ON THIS PLAN SHEET ARE RECOMMENDATIONS. THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING, INSTALLING, AND MODIFYING BMPs AS NECESSARY TO PREVENT ILLICIT DISCHARGE FROM THE PROJECT SITE.

TYPE 4 SEED TO BE USED AS EROSION CONTROL MEASURE AFTER GRADING IS COMPLETE. SEE SUDAS TABLE 9010.09 FOR MIX.



HORZ. 0 20 40
SCALE FEET

BOLTON & MENK

430 E GRAND AVENUE, SUITE 101
DES MOINES, IOWA 50309
Phone: (515) 259-9190
Email: DesMoines@bolton-menk.com
www.bolton-menk.com

DESIGNED	NW
DRAWN	BH
CHECKED	- - -
BMI PROJ. NO.	0T6.128279

REV	DESCRIPTION	DATE

CITY OF MARSHALLTOWN, IOWA

WATER PLAZA AT MEGA-10 PARK

EROSION CONTROL

SHEET CE.01

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2024-234

RESOLUTION APPROVING AMENDMENT 1 TO AGREEMENT FOR PROFESSIONAL SERVICES WITH BOLTON AND MENK, AN INCREASE OF $50,000, FOR THE RIVERVIEW PARK IMPROVEMENT PROJECT #PRK23001

WHEREAS, the City of Marshalltown, Iowa, has heretofore entered into a professional services agreement with Bolton and Menk for design services for the first phase of the Riverview Park Improvements project #PRK23001; and

WHEREAS, an increase is requested for design services.

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

Section 1. That the professional services agreement amendment 1 for the Riverview Park Improvement Project #PRK23001, in the amount of an increase of $50,000 is hereby accepted and approved.

Passed this 28th day of October 2024, and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

MARSHALLTOWN
IOWA

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

TO: Mayor & City Council
FROM: Carol Webb, City Administrator
DATE: October 24, 2024
RE: Contract Amendment – Bolton & Menk design services for Riverview Park Improvements Phase I

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 and fund improvements to the City's infrastructure and buildings.

Recommendation: Approve the contract amendment

Budget Impact: An amount not to exceed $50,000

Description/Background: In 2023, the City entered into a contract with Bolton & Menk for design services for the first phase of the Riverview Park Improvements. City staff requested that two tasks be added to the agreement, 1) for additional final design, surveying, and construction documentation associated with project scope changes to include the pickleball courts, horseshoe pits, and playground, and 2) to perform construction administration services.

The proposed contract amendment is attached.

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

AMENDMENT #001 TO AGREEMENT FOR PROFESSIONAL SERVICES
BETWEEN THE CITY OF MARSHALLTOWN AND BOLTON & MENK, INC.

This AMENDMENT #001 ("Amendment") to the original Agreement for Professional Services between The City of Marshalltown ("OWNER") and Bolton & Menk, Inc. ("ENGINEER") dated May 9th, 2023 (the "Agreement") is made and entered into on this _____ day of October, 2024.

WHEREAS, OWNER has engaged ENGINEER, pursuant to the Agreement, to furnish OWNER with engineering, design, procurement, and construction services in connection with the Riverview Park Phase One project (the "Project");

WHEREAS, OWNER and ENGINEER have agreed to amend the Agreement as set forth in this Amendment and subject to the terms and conditions of this Amendment; and,

NOW THEREFORE, for good and valuable consideration, the sufficiency of which is hereby acknowledged, the parties agree as follows:

1. SCOPE ATTACHMENT. The Scope Attachment is attached and incorporated herein by reference as Exhibit A. If the OWNER requests or ENGINEER performs additional services for the Project, ENGINEER shall make such request to OWNER in writing, setting forth any changes or additions to the Scope of the Agreement, including any additional deliverables requested for the Project in Exhibit A.

2. FEE ATTACHMENT. The Fee Attachment is attached and incorporated herein by reference as Exhibit B. If the ENGINEER requests additional fees for the services for the Project or for services performed pursuant to Exhibit A, ENGINEER shall make such request to OWNER in writing, setting forth any changes in fees and all fees associated with such additional services, in the same or substantially similar format as Exhibit B. If OWNER agrees to the change in scope or fees proposed by ENGINEER in writing, the parties will adjust the Maximum Fee to account for such changes. No claim for extra services performed by ENGINEER will be allowed by OWNER except as provided in this Amendment nor will ENGINEER perform any services or work not previously approved by OWNER except upon receipt of a written amendment.

3. Additional Forms. Exhibits A and B are attached and incorporated into the Agreement.

4. All Other Terms and Conditions of the Agreement. Any conflict on inconsistency as to terms set forth in this Amendment and the Agreement or other writing will be governed by this Amendment.

IN WITNESS WHEREOF, the parties have caused this AMENDMENT #001 to be executed by their duly authorized representatives on the dates written below.

City of Marshalltown	BOLTON & MENK, INC.
SIGNED: _____	SIGNED: _____
NAME: _____	NAME: Casey Byers
TITLE: _____	TITLE: Principal Landscape Architect
DATE: _____	DATE: 10/17/2024

EXHIBIT A – SCOPE ATTACHMENT TO AMENDMENT #001

This **SCOPE ATTACHMENT** is part of **AMENDMENT #001** to the Agreement. Unless otherwise agreed to in writing by the parties, any conflict or inconsistency as to the terms set forth in the Amendment and the Agreement shall be governed by the Amendment

TASK 9: FINAL DESIGN

Additional fee is added to Task 9 for additional final design, surveying and construction documentation associated with project scope changes to include pickleball courts, horseshoe pits and playground.

TASK 11: CONSTRUCTION SERVICES (NEW TASK)

Project duration will extend beyond bidding services completed in September 2024. Construction will begin in October 2024 and complete in August 2025. Contract services will continue to August 2025.

The **CONSULTANT** shall provide construction services as described herein for the project. The items described below are the major tasks that will be provided during the construction process.

11.1 Pre-construction Conference

The **CONSULTANT** shall conduct a pre-construction conference with the Contractor, **OWNER**, utility companies, affected entities, and all interested parties to review the contract requirements, details of construction, utility coordination, and work schedule. Meeting minutes shall be prepared and distributed by the **CONSULTANT**.

11.2 Design Interpretation Questions

The **CONSULTANT** shall answer design interpretation questions from the **OWNER**, contractor, inspector, utilities, and review agencies, up to the not-to-exceed fee.

11.3 Minor Plan Modifications

The **CONSULTANT** shall provide minor design modifications as required during construction, up to the not-to-exceed fee. It is anticipated this would include items such as adjustments to fit changed field conditions, changes in staging, and modifications to avoid utilities, etc. The **CONSULTANT** shall negotiate Major Plan Modifications required due to unforeseen field conditions with the **OWNER** and receive approval by the **OWNER** prior to making design plan changes.

11.4 Periodic Site Observation

The **CONSULTANT's** Engineer and/or Landscape Architect shall make up to six (6) periodic visits to the construction site at intervals appropriate to the stage of construction to (a) observe the progress, (b) review the quality of the work, and (c) determine if the construction work conforms to the drawings and specifications in the construction contract. Periodic Site Observation is assumed 30 total hours during construction, including travel to and from the site. If the **CLIENT** requests additional visits to the site, the

CONSULTANT will notify the **CLIENT** and additional services may be requested. The project completion date is August 1, 2025.

11.5 Final Inspection and Punch List; Final Acceptance

The **CONSULTANT** shall complete a final inspection and prepare a punch list of uncompleted items. On the basis of such inspection, the **CONSULTANT** shall determine if the project is substantially complete in accordance with the plans and specifications and shall make a recommendation to the **OWNER** regarding final payment. It is understood that the **OWNER** will accept the project only after recommendation by the **CONSULTANT**.

EXHIBIT B – FEE ATTACHMENT

This **FEE ATTACHMENT** is part of **AMENDMENT #001** to the Agreement. Unless otherwise agreed to in writing by the parties, any conflict or inconsistency as to the terms set forth in the Amendment and the Agreement shall be governed by the Amendment.

1. The parties agree to the following additional services to complete the Project, as set forth below:

AMENDMENT (SERVICES AND DELIVERABLES)		Amount
Task 9	FINAL DESIGN	$25,000.00
Task 11	CONSTRUCTION SERVICES	$25,000.00
	THIS AMENDMENT Sub-Total	$50,000.00
	(Less Reduction in Fee -if any)	
	THIS AMENDMENT TOTAL	$50,000.00

AMENDMENT (IMPACT TO BUDGET)		
ORIGINAL AGREEMENT		$218,938.00
AMENDMENT #001 (10/17/2024)	Construction Services	$268,938.00
	NEW PROJECT TOTAL, MAXIMUM FEE, NOT TO EXCEED	$268,938.00

2024-230

RESOLUTION APPROVING APPOINTMENT OF CHRISTOPHER JONES AS POLICE CHIEF FOR THE CITY OF MARSHALLTOWN, IOWA

WHEREAS, the City of Marshalltown, Iowa is anticipating the retirement of the Police Chief and desires to hire a Police Chief to direct the Marshalltown Police Department; and

WHEREAS, the City Administrator of the City of Marshalltown, the appointing authority under Section 31.030, Code of Ordinances, City of Marshalltown, has selected Christopher Jones to serve as Police Chief for the City of Marshalltown, Iowa; and

WHEREAS, under Section 400.15 of the Iowa Code to be effective such appointment must be approved by the City Council.

THEREFORE, IT IS HEREBY RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, AS FOLLOWS:

Section 1. The appointment of Christopher Jones as Police Chief for the City of Marshalltown, Iowa, is hereby approved, confirmed and ratified.

Passed this 28th day of October 2024, and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

2024-231

RESOLUTION ADOPTING THE 2025-2026 GOAL SETTING REPORT FOR THE CITY OF MARSHALLTOWN, IOWA

WHEREAS the Marshalltown City Council and staff conducted a goal setting session in October 2024; and

WHEREAS, the purpose of the goal setting session was to identify major accomplishments of the City in 2023-2024, to review the most important issues, concerns, and trends facing the City in 2025-2026, and to identify potential initiatives, policies and programs for 2025-2026; and

WHEREAS, goal setting is a disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does and why it performs the services and/or programs it does; and

WHEREAS, there are numerous benefits to goal setting and planning, including: organizations can increase effectiveness and efficiency, improve understanding through better learning, make better decisions, enhance organizational capabilities, improve communications and public relations; and

WHEREAS, the establishment of goals provides the framework for the development of the City of Marshalltown and gives City staff both a direction and a sense of purpose to the actions of the community and its organization.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL FOR THE CITY OF MARSHALLTOWN, IOWA, that the Goal Setting Report for 2025-2026 is hereby adopted.

Passed this 28th day of October 2024, and signed this _____ day of October 2024

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

MARSHALLTOWN
IOWA

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

TO: Mayor & City Council
FROM: Carol Webb, City Administrator
DATE: October 23, 2024
RE: Resolution Adopting the Marshalltown City Council 2025-2026 Goal Setting Report

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: Provide vision for the future of the city.

Recommendation: Adopt the 2025-2026 Goal Setting Report.

Budget Impact: Goals identified will be considered for funding during the City's budget process.

Description/Background:
Presented for City Council's consideration is a resolution supporting the 2025-2026 City Council Goal Setting Report. The Marshalltown City Council conducted a goal setting session in October 2024. The purpose of the session was to identify major accomplishments of the City in 2023 and 2024, to review the most important issues, concerns, and trends facing the City, and to identify potential initiatives, policies, and programs for 2025 - 2026. The attached goal setting report summarizes the discussion of the Council and City department directors during the goal setting session.

The goal setting report is attached.

City of Marshalltown, Iowa

Goal Setting Report

October 8, 2024

Mayor

Joel Greer

City Council

Mike Ladehoff

Mark Mitchell

Greg Nichols

Melisa Fonseca

Barry Kell

Jeff Schneider

Gary Thompson

City Staff

Carol Webb, City Administrator

Alicia Hunter, City Clerk

Heather Thomas, Public Works Director

Diana Steiner, Finance Director

Christopher Cross, Interim Fire Chief

Jill Petermeier, Human Resources Director

Geoff Hubbard, Parks & Recreation Director

Mike Tupper, Police Chief

Sarah Rosenblum, Library Director

Cindy Kendall, Consultant

Facilitator

Mark A. Jackson

Goal Setting Work Session

Introduction

The purpose of the Strategic Goal Setting Session is to identify and prioritize the City's overall goals for the City of Marshalltown, Iowa.

On October 8, 2024, Mark A. Jackson (facilitator) met with the Mayor, City Council, and Department Directors.

In preparation of the goals setting session the facilitator asked the Mayor, City Council, and Department Directors the following general questions:

1. What were the significant accomplishments over the last one to two years?
2. What are the specific issues, concerns, trends, and opportunities that may affect the future services, policies, finances, or operations of the City?
3. Please list any capital projects, initiatives, services, or programs that you think the city should consider.
4. What should be the City's top goals over the next 1 to 2 years?
5. Ways to improve the organizational and communication effectiveness between the Mayor & City Council and Department Directors.

Goal Setting Work Session

Mayor, City Council Members, and held a goal setting work session on October 8, 2024. City Administrator Webb provided an update on the goals from the goal setting session conducted in 2023.

The Mayor, City Council, and Department Directors held discussion on approximately 27 potential goals.

After discussion, the Mayor and Council narrowed down the following goals:

Mayor & City Council Goals

Top

Create Communications/Public Information Officer Position

Establish City-owned Garbage, Composting, and Recycling

Development of a Technology Master Plan

High

Continue Implementing Downtown Master Plan

Create Sprinkling Incentive Program for Downtown

Determine Allocation of Remaining Bond Proceeds

Remodel City Hall

Stream Line Economic Process

Significant Accomplishments

- ✓ Shift out display at library
- ✓ Passed Local Option Sales Tax
- ✓ State Street Reconstruction Project
- ✓ Grant Award – Lead
- ✓ Invested in public safety
- ✓ Court House reopened
- ✓ Awarded Destination Iowa Grant
- ✓ Edgewood Street/7th Avenue
- ✓ Completed Compensation Study
- ✓ Received Downtown revitalization grant
- ✓ GTS capabilities
- ✓ Hired new city administrator
- ✓ Certified Industrial Park
- ✓ Fundraising for trail
- ✓ Impact Program
- ✓ Improved ordinance enforcement
- ✓ $2 Million forgivable loan for wastewater treatment plant
- ✓ Downtown grant awards
- ✓ Water Plaza
- ✓ Linn Creek Projects
- ✓ Ad hoc committee on homelessness
- ✓ Multiple building improvements caused from the tornado
- ✓ Unity Point Hospital
- ✓ Demolished dilapidated buildings
- ✓ Sold vacant lots
- ✓ Improvements to Kiwanis and Peterson Parks

Issues and Concerns

- Nuisance issues – cars, neighborhoods, abandoned houses and buildings, and Mall
- Getting back to full staff

- Retention of staff
- Communication with the public
- Homelessness
- Declining revenue
- Impact from state legislation
- Increasing cost of inspections
- Stagnant population
- Unspent bond funds
- ACA funding
- Lost library levy
- Environmental – nutrient reduction
- Need single family residence
- AMPTC funding
- Sustainability of public transit
- Ability to complete grant projects
- Needed street improvements
- Lack of performance management/personnel evaluation
- Lot of little and lot of older
- Loss of ATF funding
- TIF funding
- Need EMS as an essential service
- Image has improved, but still have negative image
- Poor community, so don't have the financial resources
- School referendum
- Council getting back to the public
- Presidential election

Opportunities

- Fill holes in staff leadership positions
- Redevelopment of Main Street
- Developing interest in "Big" mall
- Old hospital
- Development of trail system

- Increase of water capacity
- Continue utilization of technology
- Collaboration with other entities on services
- Congressional earmarks
- Continue to leverage funds for quality of life projects
- Quiet zones with railroad
- Continue to move forward even with less staff
- Diverse community
- Regional community
- State high school swim meet
- First Latina elected to council
- How do we leverage our diversity
- Getting people more involved
- Publications – e.g., City of Marion
- Inspirational long term plans
- Update of comprehensive plan
- Solve the little things
- The “Veterans Capitol” of Iowa
- Leverage growing arts scene
- Creating a communication/public information position
- How do we engage and involve community

List of Capital Projects, Initiatives, Services, or Programs for Consideration

- Create Communications/Public Information Officer Position (42)
- Establish City-Owned Garbage, Composting, and Recycling (41)
- Development of a Technology Master Plan (38)
- Continue implementing downtown master plan (28)
- Create Sprinkling Incentive for Downtown (21)
- Determine allocation of remaining bonds (18)
- Remodel City Hall (15)
- Stream line Economic Process (12)
- Specific housing study to construct new housing (9)
- Asset Management System (8)
- Security of City Hall (6)
- Determine feasibility of EMS (6)
- Eliminate open burning (5)
- Funding of equipment replacement (4)

- Solar Panels at the library (4)
- Examine what services should be brought back in house and services that could be contracted out
- Water pollution control upgrade (2)
- Funding Parks & Recreation master plan (2)
- New library LIS system (1)
- Fire Department – Fire Engine, Air Pack, etc
- On-line permitting and paying on-line
- Social Worker at the library
- Develop Green incentive program
- Hire additional code enforcement officer
- Improve entrances to Marshalltown
- NE side area cleanup
- Miller neighborhood improvement

City of Marshalltown

Goal Setting Session

October 8, 2024

I. Introductions & Opening Comments

II. General Overview of the Meeting and Goal Setting Session

III. Review of Previous Goal Setting Report – Webb

IV. Identify Recent Accomplishments

V. Identify Issues and Concerns

VI. Identify Trends and Opportunities

VII. 1) Identify/List Possible:
   A) Capital Projects
   B) Initiatives, Services, and Programs

   2) Ranking of Priorities

VIII. Discussion on Improving Organizational Effectiveness

IX. Final Questions, Comments, and Suggestions

Strategic Goal Setting Session

QUESTIONNAIRE

Introduction

The purpose of the Strategic Goal Setting Session will be to identify and prioritize the City's overall goals for the next one to two years. In order to prepare for this session, you are respectfully requested to identify key programs, policies, projects, and other initiatives that will be reviewed and discussed at the session. Please complete the questionnaire and bring it with you to the session.

Significant Accomplishments

Please list the significant city accomplishments over the last one to two years. These could be as major as a street project or as basic as a newly adopted city policy on snow removal. These items do not need to be in any particular order.

_____

_____

_____

_____

_____

Issues, Concerns, Trends, and Opportunities

Please list specific issues, concerns, trends, and opportunities that affect future city services, policies, finances, or operations (for example loss of population, loss of or new economic development, or resolving a policy question). You do not need to identify potential solutions to your concern.

_____

_____

_____

_____

_____

Capital Projects

Please list capital projects or major equipment purchases you think the city should consider in the next one to two years. (for example street construction, public works and safety equipment).

_____

_____

_____

_____

Initiatives, Services, or Programs

Please list any initiatives, services, or programs that you think the city should consider in the next one to two years (for example snow removal policy, or reviewing water/sewer rates, etc).

_____

_____

_____

_____

What should be the City's top goals over the next One to Two Years?

_____

_____

_____

Organizational Effectiveness

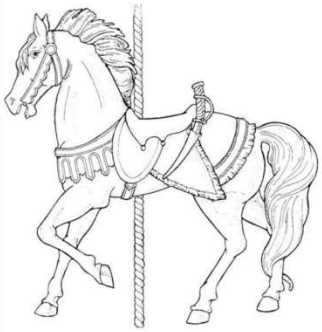
Please list things that the Mayor & Council and/or staff could do in the future to improve organizational effectiveness, decision-making, team work and the ability to accomplish the city's goals

_____

_____

_____

MARK A. JACKSON



Consulting

2024-232

RESOLUTION APPROVING THE TRANSFER OF FUNDS TO THE GROUP HEALTH INSURANCE FUND 884

WHEREAS, the City of Marshalltown self-insures their group health plan; and

WHEREAS, the Iowa Insurance Division issued a warning to the City in March 2024 that our Health Insurance Fund balance is not at an adequate level; and

WHEREAS, Council approved Resolution 2023-139 to increase health insurance premiums by 10% in August 2023 and transferring $180,000 from other funds in to increase the fund balance 884 by approximately $280,000; and

WHEREAS, the City increased premiums by 20% in January 2024; and

WHEREAS, transferring an additional $128,794 from the Employee Benefit Fund 112, $35,240 from Enterprise Funds 610-750, $3,209 from the LEAD and Section 8 HUD grants, and bill and receive reimbursement from the Marshall County Communications Commission (MCCC) $12,757 would generate approximately $180,000; and

WHEREAS, insurance premiums will be increased by 15% effective January 1, 2025;

WHEREAS, insurance claims could continue to increase, but a plan to increase the fund balance by an additional $180,000 reflects the Council's intention to provide an adequate fund balance level in the Group Health Insurance fund; and

WHEREAS, the City Council has determined that transferring funds into the Group Health Insurance Fund 884 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:

Section 1. Staff are directed to complete the transfers and billings outlined above before 12/31/24.

Section 2. Staff are to increase premiums by 15% effective 1/1/25.

Passed this 28th day of October 2024 and signed this _____ day of October 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel T.S. Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

MARSHALLTOWN
IOWA

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: October 22, 2024
RE: Group Health Insurance Fund 884

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: Staff is proposing to transfer additional funds to the Group Health Insurance Fund 884 in order to have adequate funds on hand at December 31, 2024 to comply with Iowa Code 509A's requirement to have adequate reserves in our self-insured group health plan to cover all claims, reserves, and expenses to operate the plan. In addition, staff is proposing increasing health insurance premiums by 15% effective Jan. 1, 2025 to employees, retirees, and MCCC/911 staff. Under our plan the premium is split 85% employer share and 15% employee share for active employees. This will result in a $20.12 increase per month for single coverage and $47.56 per month for family coverage. Implementing premium increases during open enrollment periods allows both employees and retirees to plan financially for increased premium costs. Note for MCCC/911, the City is reimbursed 100% of the premiums, since they are on our plan, but not City employees.

Budget Impact: With Council's approval, a transfer will be made from the Employee Benefits Fund, HUD Grant funds, Enterprise Funds, and MCCC/911 into the Health insurance fund 884 for a total amount of $180,000.

Employee benefit fund	$ 128,794	Note: this can only be used for general fund employees
HUD Lead grant	1,789	
HUD Sec 8 grant	1,420	
WPCP Enterprise	23,393	
Transit Enterprise	6,658	
Storm Enterprise	5,189	
MCCC/911	12,757	
	$ 180,000	

Employee benefits for general fund employees are levied to pay for FICA tax, workers comp, retirement, health insurance, unemployment, etc. In addition, they can be used to provide an influx into the health insurance fund for the general fund employees portion only. With the increase in premiums and the

transfer in from the other revenue sources, the Employee Benefits Fund is projected to have a $2.43 million fund balance at the end of fiscal year 2025.

Description/Background: The City self-insures its health insurance which is administered by a third party. Revenues and expenses are tracked through Fund 884. The activity in the fund balance is shown below:

		Fiscal year	Fund Balance	Change
		6/30/2020	$ 1,914,113	
		6/30/2021	$ 1,547,599	$ (366,514.00)
		6/30/2022	$ 768,497	$ (779,102.00)
		6/30/2023	$ 24,142	$ (744,355.00)
		6/30/2024	$ 64,373	$ 40,231.00
		Est 12/31/24 w $180K	$ 609,021.00	$ 544,648.00
		Est 12/31/25 w 15% incr	$ 943,597.00	$ 334,576.00
Estimates for 12/31/24 are based on similar activity in Oct-Dec as July-Sept 2024				

The City files a 509A report for the calendar year to the Iowa Insurance Division. The Insurance Division reviews to ensure there are adequate reserves to cover all claims, reserves, and expenses. The City received its first warning letter from the Insurance Division for our plan year ending 12/31/22, which the City shared with Council and discussed options for improvement. Based on the third party's analysis of claims and an assessment of the fund balance, the City increased premiums by 10% August through December 2023, generating @ $100,000 in revenue, and the City also transferred $180,000 from the Employee Benefit Fund, Grants, Enterprises, and MCCC funds for a total influx of $280,000 in revenue into Fund 884. The City received a warning for the second year from the Iowa Insurance Division stating our fund balance at 12/31/2023 was not at an adequate level. In January 2024, premiums were increased by another 20%.

City staff again evaluated the 884 Group Health Insurance Fund balance and is recommending additional transfers from the Employee Benefits, Grants, Enterprises, and MCCC totaling $180,000 to ensure adequate reserves through December 2024. The recommended transfer is anticipated to result in an ending fund balance at 12/31/2024 of $ 609,000 and $943,600 at 12/31/2025. This is based on a 5% increase in claims over FY24's actual claims. Please note that the City operates on a cash basis, but the Insurance Division analysis is based on an accrual basis, so all outstanding claims at Dec. 31 are picked up in the Insurance Board's computation, which makes it very difficult for the City to project.

From: IID Producer Licensing
To: Applicant
Subject: Warning Notification for City of Marshalltown
Date: Tuesday, March 26, 2024 3:59:07 PM

CAUTION: This email originated from outside of the City of Marshalltown. Do not click links or open attachments unless you recognize the sender and know the content is safe.

The Division is in receipt of the 509A report/opinion for the current plan year. The Iowa Insurance Division captures a significant amount of financial data from all public bodies and is deposited into a large historical database for subsequent analysis. The Division has analyzed the current filing and your plan's performance has triggered one of the three fund balance warnings below.

1. Current Year combined loss ratio > 95% (Claims and expenses) / (premiums and recoveries) > 95%
2. Excess funds (or surplus funds) of (A-B-C) < 3 weeks of claims
3. Or this plan has a negative grand total balance after accounting for all required reserves such as the IBNR claim reserve and the claims fluctuation reserve. These are required reserves under Iowa Administrative Code; see 191-35.20(3)(d)(1) and (2)].

Warning 1 or 2: When loss ratios are in the low to mid 90s and/or when excess funds are the equivalent of 3 weeks of claims or less -- these are considered early warning signs. In the event of the first two fund balance warnings, the Iowa Insurance Division recommends that you continue to monitor performance and to make proactive changes to the funding level (as necessary) before you file again next year.

Warning 3: In the case of a plan shortfall, Iowa Administrative Code rule 191-35.20(4) states: If the resources of any self-funded plan subject to this rule are not adequate to fully cover all claims under that plan, then the public body sponsoring that plan shall make up the shortfall from other resources. [Also see Iowa Code section 509A.14(2)] The reporting of a negative grand total balance means that underlying public body contribution rates or monthly premiums are likely not sufficient. Iowa Administrative Code rule 91-35.20(3)(b) states the following: Monthly accrual rates shall be established at a satisfactory level to provide funds to cover all claims, reserves, and expenses to operate the plan. Accrual rates shall be reevaluated annually.
Plans operating on thin to no margins may not be able to withstand increased claim activity while maintaining compliance with statutory requirements to maintain proper reserves as well as operating in the black. As you can see, Iowa laws and regulations do not permit self-funded public body health insurance plans to operate with deficits, and if your plan is operating with deficits, we request that you put into motion a plan to address it before the current reporting period ends. Such a plan may include changes to the benefit structure (cost-sharing, etc.), transfers from the general fund, or increases to the monthly premiums.

October 23, 2024

Via Email
Alicia Hunter
City Clerk/City Hall
Marshalltown, IA

Re: Karl of Marshalltown, LLC
Amended Development Agreement
File No. 422742-50

Dear Alicia:

Attached please find proceedings covering the adoption of a resolution approving the Amended Development Agreement with Karl of Marshalltown, LLC

We would appreciate receiving one fully executed copy of these proceedings as soon as they are available.

Please contact John Danos me if you have questions.

Kind regards,

Amy Bjork

Attachments

cc: Diana Steiner
Carol Webb

APPROVE AMENDED DEVELOPMENT AGREEMENT

(Karl of Marshalltown, LLC)

422742-50

Marshalltown, Iowa

October 28, 2024

A meeting of the City Council of the City of Marshalltown, Iowa, was held at 5:30 p.m. on October 28, 2024, at the City Council Chambers, 10 West State Street, Marshalltown, Iowa, pursuant to the rules of the Council.

The Mayor presided and the roll was called, showing members present and absent as follows:

Present: _____

Absent: _____.

Council Member _____ introduced the resolution next hereinafter set out and moved its adoption, seconded by Council Member _____; and after due consideration thereof by the Council, the Mayor put the question upon the adoption of said resolution, and the roll being called, the following named Council Members voted:

Ayes: _____

Nays: _____.

Whereupon, the Mayor declared said resolution duly adopted, as follows:

RESOLUTION 2024-233

Resolution Approving Amended Development Agreement with Karl of Marshalltown, LLC

WHEREAS, the City of Marshalltown, Iowa (the "City"), pursuant to and in strict compliance with all laws applicable to the City, and in particular the provisions of Chapter 403 of the Code of Iowa, has adopted an Urban Renewal Plan for the Marshalltown Urban Renewal Area No. 7 (the "Urban Renewal Area"); and

WHEREAS, this Council has adopted an ordinance providing for the division of taxes levied on taxable property in the Urban Renewal Area pursuant to Section 403.19 of the Code of Iowa and establishing the fund referred to in Subsection 2 of Section 403.19 of the Code of Iowa, (the "Urban Renewal Tax Revenue Fund"), which fund and the portion of taxes referred to in that subsection may be irrevocably pledged by the City for the payment of the principal of and interest on indebtedness incurred under the authority of Section 403.9 of the Code of Iowa to finance or refinance in whole or in part projects in the Urban Renewal Area; and

WHEREAS, the City has previously entered into a certain development agreement (the "Original Agreement") with Karl of Marshalltown, LLC (the "Company"), dated October 22, 2024, pursuant to which the Company agreed to undertake the remodeling of a building located at 1000 North 3rd Avenue and the construction of a new building to be located at 906 North 3rd Avenue (the "Project") for use in its business operations on certain real property (the "Property") in the Urban Renewal Area; and

WHEREAS, under the Original Agreement, the City agreed to make annual appropriation incremental property tax payments (the "Payments") to the Company in an amount not exceeding $1,800,000; and

WHEREAS, the City and the Company now propose to amend the Original Agreement in order to modify the description of the Property; and

WHEREAS, an amended development agreement (the "Amended Agreement") has been prepared to set forth the new understanding between the City and the Company, and it is now necessary to make provision for its approval; and

WHEREAS, Chapter 15A of the Code of Iowa ("Chapter 15A") declares that economic development is a public purpose for which a City may provide grants, loans, tax incentives, guarantees and other financial assistance to or for the benefit of private persons; and

WHEREAS, Chapter 15A requires that before public funds are used for grants, loans, tax incentives or other financial assistance, a City Council must determine that a public purpose will reasonably be accomplished by the spending or use of those funds; and

WHEREAS, Chapter 15A requires that in determining whether funds should be spent, a City Council must consider any or all of a series of factors; and

NOW, THEREFORE, It Is Resolved by the City Council of the City of Marshalltown, Iowa, as follows:

Section 1. Pursuant to the factors listed in Chapter 15A, the Council hereby finds and reaffirms that:

(a) The Project will add diversity and generate new opportunities for the Marshalltown and Iowa economies;

(b) The Project will generate public gains and benefits, particularly in the creation of news jobs and income, which are warranted in comparison to the amount of the proposed property tax incentives.

Section 2. The City Council further finds and reaffirms that a public purpose will reasonably be accomplished by entering into the Amended Agreement and providing continued incremental property tax payments to the Company.

Section 3. The Amended Agreement is hereby approved, and the Mayor and City Clerk are hereby authorized and directed to execute and deliver the Amended Agreement on behalf of the City in substantially the form and content in which the Amended Agreement has been presented to this City Council. Such officers are also authorized to make such changes, modifications, additions or deletions as they, with the advice of bond counsel, may believe to be necessary, and to take such actions as may be necessary to carry out the provisions of the Amended Agreement.

Section 4. All payments by the City under the Amended Agreement shall be subject to annual appropriation by the City Council, in the manner set out in the Amended Agreement. As provided and required by Chapter 403 of the Code of Iowa, the City's obligations under the Amended Agreement shall be payable solely from a subfund (the "Karl of Marshalltown, LLC Subfund") which was previously established, into which shall be paid that portion of the income and proceeds of the Urban Renewal Tax Revenue Fund attributable to property taxes derived from the Property the description of which has been updated to read, as follows:

Certain real property situated in the City of Marshalltown, Marshall County, State of Iowa bearing Marshall County Property Tax Parcel Identification Number 8418-26-201-021.

Section 5. The City hereby pledges to the payment of the Amended Agreement the Karl of Marshalltown, LLC Subfund and the taxes referred to in Subsection 2 of Section 403.19 of the Code of Iowa to be paid into such Subfund, provided, however, that no payment will be made under the Agreement unless and until monies from the Karl of Marshalltown, LLC Subfund are appropriated for such purpose by the City Council.

Section 6. After its adoption, a copy of this resolution shall be filed in the office of the County Auditor of Marshall County to evidence the continuing pledging of the Karl of Marshalltown, LLC Subfund and the portion of taxes to be paid into such Subfund and, pursuant to the direction of Section 403.19 of the Code of Iowa, the Auditor shall allocate the taxes in

accordance therewith and in accordance with the tax allocation ordinance referred to in the preamble hereof.

Section 7. All resolutions or parts thereof in conflict herewith are hereby repealed.

Passed and approved on October 28, 2024.

_____
Mayor

Attest:

_____
City Clerk

• • • • •

On motion and vote the meeting adjourned.

_____
Mayor

Attest:

_____
City Clerk

STATE OF IOWA
MARSHALL COUNTY SS:
CITY OF MARSHALLTOWN

I, the undersigned, Clerk of the City of Marshalltown, Iowa, hereby certify that the foregoing is a true and correct copy of the minutes of the Council of the City relating to adopting a resolution to approve an Amended Development Agreement.

WITNESS MY HAND hereto affixed this ___ day of _____, 2024.

_____
City Clerk

MARSHALLTOWN
IOWA

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
DATE: October 24, 2024
RE: Update TIF development agreement to change parcel number for Karl of Marshalltown

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: Staff recommend updating the parcel number on the TIF Development Agreement with Karl of Marshalltown.

Budget Impact: N/A

Background: The County Assessor combined the 3 parcel numbers originally outlined in the development agreement (8418-26-201-017, 8418-26-201-018, 8418-26-201-012) into just one parcel number 8418-26-201-021. Our attorneys from Dorsey & Whitney encouraged the City to update the TIF Development Agreement.

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

AMENDED DEVELOPMENT AGREEMENT

This Amended Development Agreement is entered into between the City of Marshalltown, Iowa (the "City") and Karl of Marshalltown, LLC (the "Company") as of the ___ day of _____, 2024 (the "Commencement Date").

WHEREAS, the City has established the Marshalltown Urban Renewal Area No. 7 (the "Urban Renewal Area"), and has adopted a tax increment ordinance for the Urban Renewal Area; and

WHEREAS, the Company owns certain real property which is situated in the City, lies within the Urban Renewal Area and is more specifically described on Exhibit A hereto (the "Property"); and

WHEREAS, the Company has proposed to undertake (i) the remodeling of an existing building on the Property (the "Remodel Project"), and (ii) the construction of a new building on the Property (the "New Building Project") for use in the Company's business operations (collectively, the Remodel Project and the New Building Project are hereinafter referred to as the "Projects"); and

WHEREAS, the Company has requested that the City provide financial assistance in the form of incremental property tax payments to be used by the Company in paying the costs of constructing and maintaining the Projects; and

WHEREAS, the base valuation (the "Base Valuation") of the Property for purposes of calculating Incremental Property Tax Revenues, as herein defined, under this Agreement and Section 403.19 of the Code of Iowa shall be the assessed taxable valuation of the Property as of January 1 of the year prior to the year in which the Triggering Certification (as herein defined) is filed; and

WHEREAS, the City and the Company entered into a Development Agreement (the "Original Agreement") dated October 22, 2022, pursuant to which the City agreed to provide financial assistance in the form of incremental property tax payments to the Company with respect to the Project; and

WHEREAS, it is now necessary to amend the Original Agreement to modify the legal description of the Property as set forth in Exhibit A hereto; and

WHEREAS, this Amended Development Agreement (the "Agreement") has been prepared to set forth the updated, mutual understanding between the City and the Company and to replace the Original Agreement; and

WHEREAS, Chapter 15A of the Code of Iowa authorizes cities to provide grants, loans, guarantees, tax incentives and other financial assistance to or for the benefit of private persons;

NOW THEREFORE, the parties hereto agree as follows:

A. Company's Covenants

1. Project Construction and Operation. The Company agrees to construct the Projects on the Property. Furthermore, the Company agrees to invest not less than $20,000,000 into capital improvements for the Projects, including construction work and other furnishings. The Company agrees to submit a detailed site plan (the "Site Plan") for the development of the Projects to the City. Upon its approval by the City, the Site Plan shall be attached hereto as Exhibit B. The Company agrees to complete the Remodel Project by no later than December 31, 2022. The Company agrees complete the New Building Project by no later than December 31, 2024.

The Company agrees to ensure that the completed Projects are being used in its business operations throughout the Term, as hereinafter defined, of this Agreement (the "Business Operations Requirement").

The Company further agrees to maintain, preserve, and keep the Property, including but not limited to the Projects, useful and in good repair and working order, ordinary wear and tear excepted, and from time to time will make all necessary repairs, replacements, renewals, and additions. Further, the Company agrees to maintain compliance with local zoning, land use, building and safety codes and regulations.

2. Property Taxes. The Company agrees to make or ensure timely payment of all property taxes as they come due with respect to that portion of the Property with the completed Projects thereon throughout the Term and to submit a receipt or cancelled check in evidence of each such payment.

3. Triggering Certification; TIF Estimate Review.

Triggering Certification: The Company agrees to provide written notification (the "Triggering Certification") to the City of its intent for the Payments (as hereinafter defined) to commence in a particular fiscal year. Such Triggering Certification shall be due by no later than October 1 of the calendar year immediately preceding the start of the fiscal year in which the Payments are intended to begin. In any event, the Triggering Certification shall be made by no later than October 1, 2025. (It is hereby acknowledged that the City's fiscal years begin on July 1 and end on the following June 30.) In submitting each such Company's Triggering Certification, the Company will complete and submit the worksheet attached hereto as Exhibit C.

Review of TIF Estimate: The Company shall review each TIF Estimate (as hereinafter defined) and request any changes thereto within ten (10) days of receipt of each TIF Estimate from the City. The Company acknowledges that failure to request changes to any TIF Estimate within ten (10) days of receipt thereof will constitute an acceptance by the Company of such TIF Estimate, and the Company shall have no right after such ten-day period to request changes or challenge the City's calculation of the TIF Estimate.

4. Default Provisions.

a. Events of Default. The following shall be "Events of Default" under this Agreement, and the term "Event of Default" shall mean, whenever it is used in this Agreement (unless otherwise provided), any one or more of the following events:

(i) Failure by the Company to complete construction of the Projects pursuant to the terms and conditions of this Agreement.

(ii) Failure by the Company to comply with the Business Operations Requirement pursuant to the terms and conditions of this Agreement.

(iii) Failure by the Company to fully and timely remit payment of property taxes when due and owing.

(iv) Failure by the Company to comply with Section A.3 of this Agreement.

(v) Failure by the Company to observe or perform any other material covenant on its part, to be observed or performed hereunder.

b. Notice and Remedies. Whenever any Event of Default described in this Agreement occurs, the City shall provide written notice to the Company describing the cause of the default and the steps that must be taken by the Company in order to cure the default. The Company shall have thirty (30) days after receipt of the notice to cure the default or to provide assurances satisfactory to City that the default will be cured as soon as reasonably possible. If the Company fails to cure the default or provide assurances, the City shall then have the right to:

(i) Pursue any action available to it, at law or in equity, in order to enforce the terms of this Agreement.

(ii) Withhold the Payments provided for under Section B.1 below.

B. City's Obligations

1. Payments. In recognition of the Company's obligations set out above, the City agrees to make twenty (20) semiannual economic development tax increment payments (the "Payments" and each, individually a "Payment") to the Company during the Term pursuant to Chapters 15A and 403 of the Code of Iowa, provided however that the aggregate, total amount of the Payments (the "Maximum Payment Total") shall not exceed $1,800,000. All Payments under this Agreement shall be subject to annual appropriation by the City Council, as provided hereunder.

The Payments shall not constitute general obligations of the City, but shall be made solely and only from Incremental Property Tax Revenues received by the City from the Marshall County Treasurer attributable to the taxable valuation of the Property.

The Payments will be made on December 1 and June 1 of each fiscal year following an affirmative appropriation decision as provided for under Section B.3 below, beginning on December 1 of the fiscal year immediately succeeding the year in which the Triggering Certification is made, and continuing through the expiration of the Term.

For example, assuming the Triggering Certification is made on October 15, 2025 and all appropriation determinations are approved affirmatively by the City Council under Section B.2 below, then Payments will be made on December 1 and June 1, beginning in the City's 2026-2027 fiscal year, and continuing for a period of nine (9) additional fiscal years thereafter, provided,

however, that no Payments shall be made after the sooner of June 1, 2036 or the date on which aggregate Payments equal to the Maximum Payment Total have been made.

2. TIF Estimate: For purposes of this Agreement, "Annual Percentage" shall mean the annual percentage in effect from time to time as set forth in the following table:

Fiscal Year of City	Annual Percentage
First Payment Year	90%
Second Payment Year	80%
Third Payment Year	65%
Fourth Payment Year	50%
Fifth Payment Year	40%
Sixth through Tenth Payment Years	30%

The City agrees to certify to the Company by no later than October 15 of each year, commencing October 15 of the year in which the Triggering Certification is filed, an amount (the "TIF Estimate") equal to the Annual Percentage of the estimated Incremental Property Tax Revenues (as hereinafter defined) anticipated to be paid in the fiscal year immediately following such certification with respect to the taxable valuation of the Property.

In submitting each such TIF Estimate, the City will complete and submit the worksheet attached hereto as Exhibit D. The City agrees that the Company will have right to review each such TIF Estimate and request revisions thereto.

For purposes of this Agreement, Incremental Property Tax Revenues are calculated by: (1) determining the consolidated property tax levy (city, county, school, etc.) then in effect with respect to taxation of the Property; (2) subtracting (a) the debt service levies of all taxing jurisdictions, (b) the school district instructional support and physical plant and equipment levies and (c) any other levies which may be exempted from such calculation by action of the Iowa General Assembly; (3) multiplying the resulting modified consolidated levy rate times any incremental growth in the taxable valuation of the Property, as shown on the property tax rolls of Marshall County, above and beyond the Base Valuation; and (4) deducting any property tax credits which shall be available with respect to the Property.

3. Annual Appropriation. The Payments shall be subject to annual appropriation by the City Council. Prior to December 1 of each year during the Term (as hereinafter defined) of this Agreement, beginning in the calendar year in which the Triggering Certification is filed, the City Council of the City shall consider the question of obligating for appropriation to the funding of the Payments due in the following fiscal year, an amount (the "Appropriated Amount") of Incremental Property Tax Revenues to be collected in the following fiscal year equal to or less than the most recently submitted Company's Estimate.

In any given fiscal year, if the City Council determines to not obligate the then-considered Appropriated Amount, then the City will be under no obligation to fund the Payments scheduled to become due in the following fiscal year, and the Company will have no rights whatsoever to compel the City to make such Payments, to seek damages relative thereto or to compel the funding

of such Payments in future fiscal years. A determination by the City Council to not obligate funds for any particular fiscal year's Payments shall not render this Agreement null and void, provided however that no Payment shall be made after June 1, 2036.

4. **Payment Amounts.** The aggregate Payments to be made in a fiscal year shall not exceed an amount equal to the corresponding Appropriated Amount (for example, for the Payments due on December 1, 2026 and on June 1, 2027, the aggregate maximum amount of such Payments would be determined by the Appropriated Amount determined for certification by December 1, 2025). Furthermore, the amount of each such Payment shall not exceed the Annual Percentage of Incremental Property Tax Revenues (excluding allocations of "back-fill" or "make-up" payments from the State of Iowa for property tax credits or roll-back) actually received by the City from the Marshall County Treasurer attributable to the taxable incremental valuation of the Property in the six (6) months immediately preceding such Payment due date.

5. **Certification of Payment Obligation.** In any given fiscal year, if the City Council determines to obligate the then-considered Appropriated Amount, as set forth in Section B.3 above, then the City Clerk will certify by December 1 of each such year to the Marshall County Auditor an amount equal to the most recently obligated Appropriated Amount.

C. **Administrative Provisions**

1. **Amendment and Assignment.** Neither party may cause this Agreement to be amended, assigned, assumed, sold or otherwise transferred without the prior written consent of the other party. However, the City hereby gives its permission that the Company's rights to receive the Payments hereunder may be assigned by the Company to a private lender, as security on a credit facility taken with respect to the Project, without further action on the part of the City.

2. **Successors.** This Agreement shall inure to the benefit of and be binding upon the successors and assigns of the parties.

3. **Term.** The term (the "Term") of this Agreement shall commence on the Commencement Date and end on June 1, 2036.

4. **Choice of Law**. This Agreement shall be deemed to be a contract made under the laws of the State of Iowa and for all purposes shall be governed by and construed in accordance with laws of the State of Iowa.

The City and the Company have caused this Agreement to be signed, in their names and on their behalf by their duly authorized officers, all as of the day and date written above.

CITY OF MARSHALLTOWN, IOWA

By: _____
Mayor

Attest:

_____
City Clerk

KARL OF MARSHALLTOWN, LLC

By: _____

4870-4707-5058\1

<u>EXHIBIT A</u>
DESCRIPTION OF THE PROPERTY

Certain real property situated in the City of Marshalltown, Marshall County, State of Iowa bearing Marshall County Property Tax Parcel Identification Number 8418-26-201-021.

<u>EXHIBIT B</u>
SITE PLAN

EXHIBIT C
COMPANY'S TRIGGERING CERTIFICATION

Date: October 1, 20____

The City of Marshalltown, Iowa (the "City") and Karl of Marshalltown, LLC (the "Company") entered into a Development Agreement dated as of the ___ day of _____, 2022 (the "Commencement Date").

Pursuant to the Development Agreement, the Company hereby certifies to the City that it intends for the process of dividing Incremental Property Tax Revenues to begin in the City's 20__ - 20__ Fiscal Year.

KARL OF MARSHALLTOWN, LLC

By:_____
[Name, Title]

EXHIBIT D
TIF ESTIMATE WORKSHEET

(1) Date of Preparation: October _____, 20____.

(2) Assessed Valuation of Property as of January 1, 20_____:

$_____.

(3) Base Taxable Valuation of Property :

$_____.

(4) Incremental Taxable Valuation of Property (2 minus 3):

$_____ (the "TIF Value").

(5) Current City fiscal year consolidated property tax levy rate for purposes of calculating Incremental Property Tax Revenues (the "Adjusted Levy Rate"):

$_____ per thousand of value.

(6) The TIF Value (4) factored by the Adjusted Levy Rate (5).

$_____x $_____/1000 = $_____ ("Available TIF")

(7) Available TIF ($_____ x Annual Percentage* (____%) = TIF Estimate ($_____).

Fiscal Year of City	Annual Percentage
First Payment Year	90%
Second Payment Year	80%
Third Payment Year	65%
Fourth Payment Year	50%
Fifth Payment Year	40%
Sixth through Tenth Payment Years	30%

AMENDED DEVELOPMENT AGREEMENT

This Amended Development Agreement is entered into between the City of Marshalltown, Iowa (the "City") and Karl of Marshalltown, LLC (the "Company") as of the ___ day of _____, ~~2022~~2024 (the "Commencement Date").

WHEREAS, the City has established the Marshalltown Urban Renewal Area No. 7 (the "Urban Renewal Area"), and has adopted a tax increment ordinance for the Urban Renewal Area; and

WHEREAS, the Company owns certain real property which is situated in the City, lies within the Urban Renewal Area and is more specifically described on Exhibit A hereto (the "Property"); and

WHEREAS, the Company has proposed to undertake (i) the remodeling of an existing building on the Property (the "Remodel Project"), and (ii) the construction of a new building on the Property (the "New Building Project") for use in the Company's business operations (collectively, the Remodel Project and the New Building Project are hereinafter referred to as the "Projects"); and

WHEREAS, the Company has requested that the City provide financial assistance in the form of incremental property tax payments to be used by the Company in paying the costs of constructing and maintaining the Projects; and

WHEREAS, the base valuation (the "Base Valuation") of the Property for purposes of calculating Incremental Property Tax Revenues, as herein defined, under this Agreement and Section 403.19 of the Code of Iowa shall be the assessed taxable valuation of the Property as of January 1 of the year prior to the year in which the Triggering Certification (as herein defined) is filed; and

WHEREAS, the City and the Company entered into a Development Agreement (the "Original Agreement") dated October 22, 2022, pursuant to which the City agreed to provide financial assistance in the form of incremental property tax payments to the Company with respect to the Project; and

WHEREAS, it is now necessary to amend the Original Agreement to modify the legal description of the Property as set forth in Exhibit A hereto; and

WHEREAS, this Amended Development Agreement (the "Agreement") has been prepared to set forth the updated, mutual understanding between the City and the Company and to replace the Original Agreement; and

WHEREAS, Chapter 15A of the Code of Iowa authorizes cities to provide grants, loans, guarantees, tax incentives and other financial assistance to or for the benefit of private persons;

NOW THEREFORE, the parties hereto agree as follows:

A. Company's Covenants

1. Project Construction and Operation. The Company agrees to construct the Projects on the Property. Furthermore, the Company agrees to invest not less than $20,000,000 into capital improvements for the Projects, including construction work and other furnishings. The Company agrees to submit a detailed site plan (the "Site Plan") for the development of the Projects to the City. Upon its approval by the City, the Site Plan shall be attached hereto as Exhibit B.~~.~~ The Company agrees to complete the Remodel Project by no later than December 31, 2022. The Company agrees complete the New Building Project by no later than December 31, 2024.

The Company agrees to ensure that the completed Projects are being used in its business operations throughout the Term, as hereinafter defined, of this Agreement (the "Business Operations Requirement").

The Company further agrees to maintain, preserve, and keep the Property, including but not limited to the Projects, useful and in good repair and working order, ordinary wear and tear excepted, and from time to time will make all necessary repairs, replacements, renewals, and additions. Further, the Company agrees to maintain compliance with local zoning, land use, building and safety codes and regulations.

2. Property Taxes. The Company agrees to make or ensure timely payment of all property taxes as they come due with respect to that portion of the Property with the completed Projects thereon throughout the Term and to submit a receipt or cancelled check in evidence of each such payment.

3. Triggering Certification; TIF Estimate Review.

Triggering Certification: The Company agrees to provide written notification (the "Triggering Certification") to the City of its intent for the Payments (as hereinafter defined) to commence in a particular fiscal year. Such Triggering Certification shall be due by no later than October 1 of the calendar year immediately preceding the start of the fiscal year in which the Payments are intended to begin. In any event, the Triggering Certification shall be made by no later than October 1, 2025. (It is hereby acknowledged that the City's fiscal years begin on July 1 and end on the following June 30.) In submitting each such Company's Triggering Certification, the Company will complete and submit the worksheet attached hereto as Exhibit C.

Review of TIF Estimate: The Company shall review each TIF Estimate (as hereinafter defined) and request any changes thereto within ten (10) days of receipt of each TIF Estimate from the City. The Company acknowledges that failure to request changes to any TIF Estimate within ten (10) days of receipt thereof will constitute an acceptance by the Company of such TIF Estimate, and the Company shall have no right after such ten-day period to request changes or challenge the City's calculation of the TIF Estimate.

4. Default Provisions.

a. Events of Default. The following shall be "Events of Default" under this Agreement, and the term "Event of Default" shall mean, whenever it is used in this Agreement (unless otherwise provided), any one or more of the following events:

(i) Failure by the Company to complete construction of the Projects pursuant to the terms and conditions of this Agreement.

(ii) Failure by the Company to comply with the Business Operations Requirement pursuant to the terms and conditions of this Agreement.

(iii) Failure by the Company to fully and timely remit payment of property taxes when due and owing.

(iv) Failure by the Company to comply with Section A.3 of this Agreement.

(v) Failure by the Company to observe or perform any other material covenant on its part, to be observed or performed hereunder.

b. Notice and Remedies. Whenever any Event of Default described in this Agreement occurs, the City shall provide written notice to the Company describing the cause of the default and the steps that must be taken by the Company in order to cure the default. The Company shall have thirty (30) days after receipt of the notice to cure the default or to provide assurances satisfactory to City that the default will be cured as soon as reasonably possible. If the Company fails to cure the default or provide assurances, the City shall then have the right to:

(i) Pursue any action available to it, at law or in equity, in order to enforce the terms of this Agreement.

(ii) Withhold the Payments provided for under Section B.1 below.

B. City's Obligations

1. Payments. In recognition of the Company's obligations set out above, the City agrees to make twenty (20) semiannual economic development tax increment payments (the "Payments" and each, individually a "Payment") to the Company during the Term pursuant to Chapters 15A and 403 of the Code of Iowa, provided however that the aggregate, total amount of the Payments (the "Maximum Payment Total") shall not exceed $1,800,000. All Payments under this Agreement shall be subject to annual appropriation by the City Council, as provided hereunder.

The Payments shall not constitute general obligations of the City, but shall be made solely and only from Incremental Property Tax Revenues received by the City from the Marshall County Treasurer attributable to the taxable valuation of the Property.

~~Prior to funding any Payments under this Agreement, the City will first withhold from the Incremental Property Tax Revenues an amount equal to the Admin Withholding Amount. Once an amount equal to the Admin Withholding Amount has been withheld by the City, the Payments shall be made as hereinafter set forth.~~

The Payments will be made on December 1 and June 1 of each fiscal year following an affirmative appropriation decision as provided for under Section B.3 below, beginning on December 1 of the fiscal year immediately succeeding the year in which the Triggering Certification is made, and continuing through the expiration of the Term.

For example, assuming the Triggering Certification is made on October 15, 2025 and all appropriation determinations are approved affirmatively by the City Council under Section B.2 below, then Payments will be made on December 1 and June 1, beginning in the City's 2026-2027 fiscal year, and continuing for a period of nine (9) additional fiscal years thereafter, provided, however, that no Payments shall be made after the sooner of June 1, 2036 or the date on which aggregate Payments equal to the Maximum Payment Total have been made.

2. TIF Estimate: For purposes of this Agreement, "Annual Percentage" shall mean the annual percentage in effect from time to time as set forth in the following table:

Fiscal Year of City	Annual Percentage
First Payment Year	90%
Second Payment Year	80%
Third Payment Year	65%
Fourth Payment Year	50%
Fifth Payment Year	40%
Sixth through Tenth Payment Years	30%

The City agrees to certify to the Company by no later than October 15 of each year, commencing October 15 of the year in which the Triggering Certification is filed, an amount (the "TIF Estimate") equal to the Annual Percentage of the estimated Incremental Property Tax Revenues (as hereinafter defined) anticipated to be paid in the fiscal year immediately following such certification with respect to the taxable valuation of the Property.

In submitting each such TIF Estimate, the City will complete and submit the worksheet attached hereto as Exhibit D. The City agrees that the Company will have right to review each such TIF Estimate and request revisions thereto.

For purposes of this Agreement, Incremental Property Tax Revenues are calculated by: (1) determining the consolidated property tax levy (city, county, school, etc.) then in effect with respect to taxation of the Property; (2) subtracting (a) the debt service levies of all taxing jurisdictions, (b) the school district instructional support and physical plant and equipment levies and (c) any other levies which may be exempted from such calculation by action of the Iowa General Assembly; (3) multiplying the resulting modified consolidated levy rate times any incremental growth in the taxable valuation of the Property, as shown on the property tax rolls of Marshall County, above and beyond the Base Valuation; and (4) deducting any property tax credits which shall be available with respect to the Property.

3. Annual Appropriation. The Payments shall be subject to annual appropriation by the City Council. Prior to December 1 of each year during the Term (as hereinafter defined) of this Agreement, beginning in the calendar year in which the Triggering

Certification is filed, the City Council of the City shall consider the question of obligating for appropriation to the funding of the Payments due in the following fiscal year, an amount (the "Appropriated Amount") of Incremental Property Tax Revenues to be collected in the following fiscal year equal to or less than the most recently submitted Company's Estimate.

In any given fiscal year, if the City Council determines to not obligate the then-considered Appropriated Amount, then the City will be under no obligation to fund the Payments scheduled to become due in the following fiscal year, and the Company will have no rights whatsoever to compel the City to make such Payments, to seek damages relative thereto or to compel the funding of such Payments in future fiscal years. A determination by the City Council to not obligate funds for any particular fiscal year's Payments shall not render this Agreement null and void, provided however that no Payment shall be made after June 1, 2036.

4. **Payment Amounts.** The aggregate Payments to be made in a fiscal year shall not exceed an amount equal to the corresponding Appropriated Amount (for example, for the Payments due on December 1, 2026 and on June 1, 2027, the aggregate maximum amount of such Payments would be determined by the Appropriated Amount determined for certification by December 1, 2025). Furthermore, the amount of each such Payment shall not exceed the Annual Percentage of Incremental Property Tax Revenues (excluding allocations of "back-fill" or "make-up" payments from the State of Iowa for property tax credits or roll-back) actually received by the City from the Marshall County Treasurer attributable to the taxable incremental valuation of the Property in the six (6) months immediately preceding such Payment due date.

5. **Certification of Payment Obligation.** In any given fiscal year, if the City Council determines to obligate the then-considered Appropriated Amount, as set forth in Section B.3 above, then the City Clerk will certify by December 1 of each such year to the Marshall County Auditor an amount equal to the most recently obligated Appropriated Amount.

C. **Administrative Provisions**

1. **Amendment and Assignment.** Neither party may cause this Agreement to be amended, assigned, assumed, sold or otherwise transferred without the prior written consent of the other party. However, the City hereby gives its permission that the Company's rights to receive the Payments hereunder may be assigned by the Company to a private lender, as security on a credit facility taken with respect to the Project, without further action on the part of the City.

2. **Successors.** This Agreement shall inure to the benefit of and be binding upon the successors and assigns of the parties.

3. **Term.** The term (the "Term") of this Agreement shall commence on the Commencement Date and end on June 1, 2036.

4. **Choice of Law**. This Agreement shall be deemed to be a contract made under the laws of the State of Iowa and for all purposes shall be governed by and construed in accordance with laws of the State of Iowa.

The City and the Company have caused this Agreement to be signed, in their names and on their behalf by their duly authorized officers, all as of the day and date written above.

CITY OF MARSHALLTOWN, IOWA

By: _____
Mayor

Attest:

_____
City Clerk

KARL OF MARSHALLTOWN, LLC

By: _____

EXHIBIT A
DESCRIPTION OF THE PROPERTY

Certain real property situated in the City of Marshalltown, Marshall County, State of Iowa bearing Marshall County Property Tax Parcel Identification ~~Numbers 8418-26-201-018, 8418-26-201-012 and 8418-26-201-017~~Number 8418-26-201-021.

EXHIBIT B
SITE PLAN

EXHIBIT C
COMPANY'S TRIGGERING CERTIFICATION

Date: October 1, 20____

The City of Marshalltown, Iowa (the "City") and Karl of Marshalltown, LLC (the "Company") entered into a Development Agreement dated as of the ___ day of _____, 2022 (the "Commencement Date").

Pursuant to the Development Agreement, the Company hereby certifies to the City that it intends for the process of dividing Incremental Property Tax Revenues to begin in the City's 20__ - 20__ Fiscal Year.

KARL OF MARSHALLTOWN, LLC

By:_____
[Name, Title]

EXHIBIT D
TIF ESTIMATE WORKSHEET

(1) Date of Preparation: October _____, 20____.

(2) Assessed Valuation of Property as of January 1, 20_____:

$_____.

(3) Base Taxable Valuation of Property :

$_____.

(4) Incremental Taxable Valuation of Property (2 minus 3):

$_____ (the "TIF Value").

(5) Current City fiscal year consolidated property tax levy rate for purposes of calculating Incremental Property Tax Revenues (the "Adjusted Levy Rate"):

$_____ per thousand of value.

(6) The TIF Value (4) factored by the Adjusted Levy Rate (5).

$_____x $_____/1000 = $_____ ("Available TIF")

(7) Available TIF ($_____ x Annual Percentage* (____%) = TIF Estimate ($_____).

Fiscal Year of City	Annual Percentage
First Payment Year	90%
Second Payment Year	80%
Third Payment Year	65%
Fourth Payment Year	50%
Fifth Payment Year	40%
Sixth through Tenth Payment Years	30%

Summary report: **Litera Compare for Word 11.6.0.100 Document comparison done on 10/23/2024 11:25:36 AM**	
Style name: Default Style	
Intelligent Table Comparison: Active	
Original DMS: nd://4889-9130-1681/5/Development Agreement (Karl) (Marshalltown #50 2022).docx	
Modified DMS: nd://4870-4707-5058/1/Amended Development Agreement (Karl) (Marshalltown #50 2024).docx	
Changes:	
Add	10
~~Delete~~	6
~~Move From~~	0
Move To	0
Table Insert	0
~~Table Delete~~	0
Table moves to	0
~~Table moves from~~	0
Embedded Graphics (Visio, ChemDraw, Images etc.)	0
Embedded Excel	0
Format changes	0
Total Changes:	16

ORDINANCE 15092

AN ORDINANCE TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA, BY REPEALING CHAPTER 72 PARKING RULES AND ADOPTING NEW CODE SECTIONS FOR CHAPTER 72 PARKING RULES

WHEREAS, the City Council of the City of Marshalltown, Iowa has adopted Chapter 72 Parking Rules; and

WHEREAS, the Plan Zoning Commission and staff have identified various provisions of Chapter 72 that require amendment; and

WHEREAS, the City Council finds the following amendment to be in the best interest of the City of Marshalltown.

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

Section 1. The Code of Ordinances of the City of Marshalltown is hereby amended by repealing Chapter 72: Parking Rules and adopting the following in its place:

CHAPTER 72: PARKING RULES

Section

General
72.001 Definitions
Stopping, Standing, or Parking
72.101 General prohibition
72.102 Overtime and alternate parking
72.103 Semi-tractors, trucks, or trailers
72.104 Responsibility for vehicles
72.105 Removal of unattended vehicle from bridge, tunnel, or causeway
72.106 Stopping on traveled way
72.107 Moving another's vehicle
72.108 Theaters, hotels, and auditoriums
72.109 Parking at right-hand curb
72.110 Parking within lines
72.111 Parking over 24 hours
72.112 Bus stops and taxicab stands
72.113 Street right-of-way & Terrace parking
72.114 Median strips
72.115 Parking in alleys
72.116 Municipally-owned parking lots
72.117 Street parking near intersections
Parking on Residential Properties
72.201 Purpose
72.202 Scope

72.203 Driveways; number, composition, location, and size
72.204 Driveway extensions in front yards; exceptions
72.205 Residential parking
72.206 Unlicensed, inoperable vehicles
72.207 Responsibility for violations
72.208 No prior notice, warning required

Parking on Business Properties

72.301 Purpose
72.302 Scope
72.303 Driveways and parking
72.304 Unlicensed, inoperable vehicles
72.305 Responsibility for violations
72.306 No prior notice, warning required

Special Stops

72.401 Railroads; obedience to signals; crossings
72.402 Primary roads designated as through highways
72.403 Emerging and yielding when emerging from private roadway, alley, building, or driveway

Habitual Violator Penalty and Procedures

72.501 Habitual violator
72.502 Removal and impoundment of illegally parked vehicles
72.503 Right of owner to redeem impounded vehicle
72.504 Right to hearing
72.505 Conduct of hearing

Penalty

72.999 Penalty

GENERAL

§ 72.001 DEFINITIONS.

(A) For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

ALLEY. The same as defined in § 156.M.003 of this code of ordinances.

BUSINESS: an organization or enterprising entity engaged in commercial, industrial, or professional activities. Businesses can be for-profit entities or non-profit organizations. Excludes home occupations (home-based businesses defined in § 156.C.007.G.1).

BUSINESS DISTRICT. The same as defined in § 70.001 of this code of ordinances.

CORNER LOT. A lot located at the junction of at least two streets or private ways, or at least two segments of a curved street or private ways, at which the angle of intersection is no greater than 135 degrees.

CURB CUT OR CURB DROP. A cut made through the street curb that has previously been authorized and approved by the city.

DRIVEWAY. A surface consisting of materials allowed in section § 72.203 constructed and maintained in quality, quantity, and size to prevent the creation of ruts in, or deterioration or damage to, the driveway surface or soil beneath from the operation or parking of vehicles, trailers, or recreational vehicles located within a yard and connected to an approved curb drop or entrance.

DRIVEWAY APRON. The portion of a driveway which is located in the street right-of-way.

DRIVEWAY EXTENSION. The portion of a driveway which is in excess of the allotted driveway width, which is contiguous to a driveway which shall lead to a curb drop or entrance, and which consists of materials allowed in section § 72.203 constructed and maintained in quality, quantity, and size to prevent the creation of ruts in, or deterioration or damage to, the driveway extension or soil beneath from the operation or parking of vehicles, trailers, recreational vehicles thereon.

DWELLING; DWELLING, APARTMENT; DWELLING, DUPLEX; DWELLING, MULTIPLEX; DWELLING, SINGLE-FAMILY ATTACHED; DWELLING, SINGLE-FAMILY DETACHED; DWELLING, TOWNHOUSE; and DWELLING, UNIT. The same as defined in § 156.M.003 of this code of ordinances.

ENTRANCE. A portion of the driveway that is the approved exit from a street or alley onto private property, which has previously been authorized and approved by the city.

FRONTAGE. The length of a property line of any one premises abutting and parallel to a public street right-of-way.

FRONT YARD. The portion of the parcel that is between the street right-of-way line and the front and closest face of the dwelling containing the primary entrance. Refer to § 156: Zoning for additional information.

LOT. A tract of land represented and identified by number or letter designation on an official plat.

REAR YARD. The portion of the parcel that remains that is not classified as either front, side street front, or side yard. Refer to § 156: Zoning for additional information.

RECREATIONAL VEHICLE. A vehicle designed for recreational use such as camping (means a vehicular or portable unit designed to be mounted on a chassis and wheels, which either has its own motive power or is mounted on or drawn by another vehicle, such as travel trailers, fifth wheel trailers, camping trailers, motor homes, or truck campers which may be used as a temporary dwelling or sleeping place.)

RESIDENCE DISTRICT. The same as defined in § 70.001 of this code of ordinances.

RESIDENTIAL ZONE. Any area of the city designated by the official zoning map of the city as Rural Residential (RR), Low-Density Residential (RL), Medium-Density Residential (RM), High-Density Residential (RH), or Planned Unit Development District with majority Residential Uses.

SIDE STREET FRONT YARD. On a corner lot, the portion of the parcel adjacent to street right-of-way that is between the front yard and parcel line opposite of the side of the primary entrance of the primary structure or dwelling. The side street front yard extends along the side of the structure/dwelling and the side street to the rear lot line. Refer to § 156: Zoning for additional information.

SIDE YARD. The portion of the parcel that is between the front yard and the rear and furthest face of the primary structure or dwelling that is not adjacent to the street right-of-way. Refer to § 156: Zoning for additional information.

STREET. The same as defined in § 156.M.003 of this code of ordinances.

TRAILER. The same as defined in § 70.001 of this code of ordinances.

VEHICLE. The same as defined in § 70.001 of this code of ordinances.

(B) All other words and terms, not enumerated in division (A) above shall be defined as provided in other chapters of this code of ordinances.

STOPPING, STANDING OR PARKING

§ 72.101 GENERAL PROHIBITION.

No person shall stop, stand, or park a vehicle, trailer, or recreational vehicle, except when necessary to avoid conflict with other traffic or in compliance with the directions of a police officer or traffic control device, in any of the following places:

(A) On a sidewalk or portion thereof;

(B) In front of a public or private driveway;

(C) Within an intersection;

(D) Within five feet of a fire hydrant;

(E) On a crosswalk;

(F) Within ten feet upon the approach to any flashing beacon, stop sign, or traffic control signal located at the side of a roadway;

(G) Between a safety zone and the adjacent curb or within ten feet of points on the curb immediately opposite the ends of a safety zone, unless a different length is indicated by signs or markings;

(H) Within 50 feet of the nearest rail of a railroad crossing, except when parked parallel with such rail and not exhibiting a red light;

(I) Within 20 feet of the driveway entrance to any fire station and on the side of a street opposite the entrance to any fire station within 75 feet of the entrance when properly signed;

(J) Alongside or opposite any street excavation or obstruction when such stopping, standing, or parking would obstruct traffic;

(K) On the roadway side of any vehicle, trailer, or recreational vehicle stopped or parked at the edge or curb of a street;

(L) At any place where official signs prohibit stopping or parking;

(M) Upon any street within the corporate limits of the city when stopping, standing, or parking is prohibited by a general ordinance of uniform application relating to the removal of snow or ice from the streets;

(N) In front of a curb cut or ramp that is located on public or private property in a manner that blocks access to the curb cut or ramp; and/or

(O) On the terrace or easement area if visual hazard.

(P) On any grass or dirt except as otherwise noted in this chapter or § 156: Zoning.

Penalty, see § 71.999 and § 72.999. Statutory reference: Similar provisions, see I.C.A. § 321.358.

§ 72.102 OVERTIME AND ALTERNATE PARKING.

(A) No person shall cause, allow, permit, or suffer any vehicle, trailer, or recreational vehicle registered in the name of or operated by such person to be parked overtime or beyond the period of legal parking time at any location designated.

(B) In reference to overtime parking, the method of parking shall be as follows: every vehicle, trailer, or recreational vehicle stopped or parked upon a roadway shall be stopped or parked with the wheels parallel with and within 18 inches of the curb, and not closer than four feet end to end from another vehicle, trailer, or recreational vehicle.

(C) (1) Overtime alternate parking shall apply to all streets within the incorporated limits of the city, except as to streets or portions of streets hereinafter expressly excluded or not signed as such.

(2) Overtime alternate parking shall apply to the entire length or course of said street within the incorporated limits of the city, except as to such portion hereinafter expressly excluded or not signed as such.

(D) Streets and avenues running in an easterly and westerly direction, parking on the south side of said street or avenue before 9:00 a.m. is prohibited on Monday, Wednesday, Friday, and Sunday, and on the north side of said street or avenue before 9:00 a.m. on Tuesday, Thursday, and Saturday.

(E) Streets and avenues running in a northerly and southerly direction, parking shall be prohibited on the west side of said streets and avenues before 9:00 a.m. Tuesday, Thursday, and Saturday, and on the east side of the street or avenue before 9:00 a.m. Monday, Wednesday, Friday and Sunday.

(F) This section shall have no application and is expressly declared to be inapplicable to the existing parking ordinances or regulations regarding the portions of streets and avenues bordering on and immediately adjacent to all public school grounds and also the portions of streets and avenues bordering on and immediately adjacent to all parochial school grounds.

(G) (1) General.

(a) A street or avenue beginning in a straight course from Main Street in a southerly and northerly direction, and then taking a diagonal course, shall for the purpose of this section be classified throughout its length as a north and south street or avenue. A street or avenue beginning in a straight course from Center Street in an easterly and westerly direction and then taking a diagonal course, shall, for the purpose of this section, be classified throughout its length as an east and west street or avenue.

(b) All other diagonal streets or avenues shall be deemed north and south streets if they angle less than 45 degrees from true north.

(c) All other diagonal streets or avenues shall be deemed east and west streets or avenues if they angle more than 45 degrees from true north.

(2) Curved streets. Streets curved in part shall be classified as north and south streets if the major portion thereof runs in a northerly and southerly direction. Streets curved in part shall be classified as east and west streets if the major portion thereof runs in an easterly and westerly direction.

(3) Specific designations. Brentwood Road and Brentwood Place shall be declared north and south streets or avenues for the purpose of this section. Brentwood Terrace shall be deemed and so declared an east and west street or avenue for the purpose of this section.

(H) (1) The principle of the use of alternate sides for the control of the parking or leave standing of vehicle, trailer, or recreational vehicle is hereby established.

(2) The hour of change shall be at 9:00 a.m. on each day of the week on the streets and avenues herein covered.

(I) Appropriate signs stating thereon "NO PARKING" followed by the days of the week on which a vehicle, trailer, or recreational vehicle shall not be parked or left standing shall be placed and maintained by the Street Department adjacent to the curb along the portions of the street included in the provisions of this section.

Penalty, see § 72.999.

§ 72.103 SEMI-TRACTORS, TRUCKS OR TRAILERS.

(A) The stopping, parking, or leaving standing of a semi-tractor, truck, or trailer, either alone or in conjunction with each other with a five-and-one-half-ton license or more for more than three hours is considered an overtime parking violation and hereby prohibited in any residential zone in the city; provided, however, that, the Police Department shall allow parking in excess of three hours when the tractor, truck or trailer is parked to render a service in the immediate vicinity.

(B) Semi-trailers located within residential or commercial zones must be licensed, fully road operational, and may not be used for storage purposes unless part of an active city-permitted construction project.

Penalty, see § 72.999.

§ 72.104 RESPONSIBILITY FOR VEHICLES.

(A) Scope of section. This section shall apply to all vehicles, trailers, or recreational vehicles parked within the city in violation of ordinances regulating parking.

(B) Owner's responsibility. If any vehicle, trailer, or recreational vehicle is found stopped, standing, or parked in any manner violative of ordinances concerning parking, when the identity of the operator cannot be determined, the owner or person or corporation in whose name the vehicle, trailer, or recreational vehicle is registered shall be held prima facie responsible for the violation.

Penalty, see § 72.999.

§ 72.105 REMOVAL OF UNATTENDED VEHICLE FROM BRIDGE, TUNNEL OR CAUSEWAY.

Whenever any peace officer finds a vehicle, trailer, or recreational vehicle unattended upon any bridge or causeway or in any tunnel where such vehicle, trailer, or recreational vehicle constitutes

an obstruction to traffic, such officer is authorized to provide for the removal of such vehicle, trailer, or recreational vehicle to the nearest garage or other place of safety.
Statutory reference: Similar provisions, see I.C.A. § 321.357.

§ 72.106 STOPPING ON TRAVELED WAY.

(A) (1) (i) Upon any state or federal highway outside of a business or residence district, no person shall stop, park or leave standing any vehicle, trailer, or recreational vehicle, whether attended or unattended, upon the paved or improved or main-traveled part of the state or federal highway when it is practical to stop, park or so leave such vehicle, trailer or recreational vehicle off such part of the state or federal highway, but in every event a clear and unobstructed width of at least 20 feet of such part of the state or federal highway opposite such standing vehicle, trailer, or recreational vehicle shall be left for the free passage of other vehiclesand a clear view of such stopped vehiclesshall be available from a distance of 200 feet in each direction upon such state or federal highway; provided, however, school buses may stop on a state or federal highway for receiving and discharge pupils, and all other vehicles shall stop for school buses which are stopped to receive or discharge pupils, as provided in § 71.089 of this code of ordinances.
(A) (1) (ii) Upon any street outside of a business or residence district, no person shall stop, park or leave standing any vehicle, trailer or recreational vehicle, whether attended or unattended, upon the main-traveled portion of the street designed for the through movement of vehicles, exclusive of auxiliary lanes or designated parking lanes/areas thereon as otherwise permitted by the City or as set forth in an approved ordinance; provided, however, school buses may stop on a street for receiving and discharge of pupils, and all other vehicles, trailers or recreational vehicles shall stop for school buses which are stopped to receive or discharge pupils, as provided in § 71.089 of this code of ordinances.

(2) This section shall not apply to a vehicle, trailer, or recreational vehicle making a turn as provided in § 71.040 of this code of ordinances.

(3) This section also does not apply to the stopping or parking of a maintenance vehicle or trailer operated by a street authority on the main-traveled way of any roadway when necessary to the function being performed and when early warning devices are properly displayed.

(B) The provisions of division (A) above shall not apply to the driver of any vehicle, trailer, or recreational vehicle that is disabled while on the paved or improved or main-traveled portion of a street in such manner and to such extent that it is impossible to avoid so stopping and temporarily leaving such disabled vehicle, trailer, or recreational vehicle in such position.

(C) Whenever any peace officer finds a vehicle, trailer, or recreational vehicle standing upon a street in violation of any of the provisions of this section, such officer is authorized to move such vehicle, trailer, or recreational vehicle or require the driver or other person in charge of the vehicle, trailer, or recreational vehicle to move the vehicle, trailer, or recreational vehicle to a position off the paved or improved or main-traveled part of such street.
Penalty, see § 71.999. Statutory reference: Similar provisions, see I.C.A. §§ 321.354 through 321.356.

§ 72.107 MOVING ANOTHER'S VEHICLE.

No person shall move a vehicle, trailer, or recreational vehicle not owned by such person into any such prohibited area or away from a curb such distance as is unlawful.
Penalty, see § 71.999. Statutory reference: Similar provisions, see I.C.A. § 321.359.

§ 72.108 THEATERS, HOTELS AND AUDITORIUMS.

A space of not to exceed 50 feet is reserved at the side of the street in front of any theater, auditorium, or hotel having more than 25 sleeping rooms, or other building where large assemblages of people are being held, within which space, when clearly marked as such, no vehicle, trailer, or recreational vehicle shall be left standing, parked or stopped, except in taking on or discharging passengers or freight, and then only for such length of time as is necessary for such purpose.

Penalty, see § 72.999. Statutory reference: Similar provisions, see I.C.A. § 321.360.

§ 72.109 PARKING AT RIGHT-HAND CURB.

Except where angle or center parking or parking of a vehicle, trailer, or recreational vehicle with the left-hand wheels adjacent to and within 18 inches of the left-hand curb of a one-way roadway is permitted by ordinance, every vehicle, trailer, or recreational vehicle stopped or parked upon a roadway where there is an adjacent curb shall be so stopped or parked with the right-hand wheels of such vehicle, trailer, or recreational vehicle parallel with and within 18 inches of the right-hand curb.

Penalty, see § 72.999. Statutory reference: Similar provisions, see I.C.A. § 321.361.

§ 72.110 PARKING WITHIN LINES.

Whenever stalls or sections for vehicles, trailers, or recreational vehicles are marked or painted upon the surface of any street or municipally owned or leased parking lot, the driver or operator of any vehicle, trailer, or recreational vehicle shall park the vehicle, trailer, or recreational vehicle within the limits of one of the stalls or sections and not over or across the lines.

Penalty, see § 72.999.

§ 72.111 PARKING OVER 24 HOURS.

(A) It shall be unlawful for any person to stop, park, or leave standing any vehicle, trailer, recreational vehicle, machinery, mobile or movable equipment of any kind upon any street, avenue, alley, or highway for more than 24 consecutive hours; however, this section shall not apply to vehicles, trailers or recreational vehicles, machinery, mobile or movable equipment being used to move, deliver and/or take articles to and from a yard or building or structure located thereon or used in connection with providing a temporary service thereon for a reasonable period of time while in the active process of such use.

Penalty, see § 72.999.

§ 72.112 BUS STOPS AND TAXICAB STANDS.

It shall be unlawful to stop, park, or leave standing any vehicle in any bus stop or taxicab stand, except that a temporary stop may be made to load or unload passengers.

Penalty, see § 72.999.

§ 72.113 STREET RIGHT-OF-WAY & TERRACE PARKING.

Absent a designated parking area that does not create a visual hazard pursuant to 156.B.008a-1, it shall be unlawful for any person to park or leave standing any vehicle, trailer, or recreational vehicle on any street right-of-way or terrace area between the outside curb line of any public street, road or avenue and the outside walk line (if present) or right-of-way property line of any street at any time or to use such terrace for the storage or parking of any such vehicle, trailer, or recreational

vehicle; however, this section shall not apply to vehicles, trailers or recreational vehicles, machinery, mobile or movable equipment being used to move, deliver and/or take articles to and from a yard or building or structure located thereon or used in connection with providing a temporary service thereon for a reasonable period of time while in the active process of such use.
Penalty, see § 72.999.

§ 72.114 MEDIAN STRIPS.

It shall be unlawful for any person to stop, park, or leave standing any vehicle, trailer, or recreational vehicle on any part or portion of any median strip.
Penalty, see § 72.999.

§ 72.115 PARKING IN ALLEYS.

(A) It shall be unlawful to stop, park, or leave standing any vehicle, trailer, or recreational vehicle in any alley at any time, even for loading or unloading, where the city has strictly prohibited blocking of such alley by the posting of permanent or temporary signage. This subsection shall not apply to garbage, refuse, or recycling collection where loading and unloading occurs with the vehicle running; persons performing the collection services stay within 30 feet of the vehicle at all times; services are immediately and continuously rendered until the vehicle is moved; and services are anticipated to take less than 2 minutes.

(B) If no designated signage prohibiting the blocking of an alley exists, an alley may be blocked only to load or unload for a reasonable period of time, and in no event shall exceed 30 minutes.
Penalty, see § 72.999.

§ 72.116 MUNICIPALLY-OWNED PARKING LOTS.

(A) *Blocking access or traffic flow in parking lots*. No vehicle, trailer, or recreational vehicle shall be parked in any lot in any manner or of such size to block the free access or flow of traffic in and through any parking lot.

(B) *Impoundment of vehicles left on municipally-owned parking lots*. Any vehicle parked or left standing on any municipally owned or municipally leased parking lot for longer than 72 continuous hours may be removed therefrom and stored under the direction of the Police Department or Parking and Code Enforcement Officer, and all costs of such removal and storage shall be payable by the operator or owner thereof. Any expense incurred therefor shall be in addition to the assessment of any fine or costs arising out of any violation of this subchapter.

(C) *Impoundment of semi-trucks, construction equipment, trailers, or recreational vehicles left overnight in municipally-owned parking lots.* Any semi-trucks, construction equipment, trailers, or recreational vehicles parked or left standing on any municipally owned or municipally leased parking lot overnight between the hours of 9:00 PM and 5:30 AM, without authorization from the Public Works Department, may be removed therefrom and stored under the direction of the Police Department or Parking and Code Enforcement Officer, and all costs of such removal and storage shall be payable by the operator or owner thereof. Any expense incurred therefor shall be in addition to the assessment of any fine or costs arising out of any violation of this subchapter.
Penalty, see § 72.999.

§ 72.117 STREET PARKING NEAR INTERSECTIONS.

(A) It shall be unlawful to stop, park, or leave standing any vehicle, trailer, or recreational vehicle on any street or avenue within 20 feet of the sidewalk extended to the curb at any street or avenue intersection. In areas where no sidewalk exists, it shall be the extension of the street right-of-way line.

(B) Upon application of the Director of Public Works/City Engineer at designated intersections and school crossings, it shall be unlawful to stop, park, or leave standing any vehicle, trailer, or recreational vehicle on any street or avenue within 40 feet of the sidewalk extended to the curb at any street or avenue intersection or within 40 feet of a school crossing. In areas where no sidewalk exists, it shall be the extension of the street right-of-way line.

(C) Upon approval by the City Council as an ordinance, additional prohibited parking areas may be designated.

(D) In divisions (B) and (C), above, it shall be indicated by appropriate signage. Yellow striping of the curb may be used in addition, all consistent with uniform practices.

Penalty, see § 72.999.

PARKING ON RESIDENTIAL PROPERTIES

§ 72.201 PURPOSE.

(A) The purpose of the residential parking regulations in this subchapter is to prevent the unreasonable diminishing or impairment of established property values and aesthetics within the city and to preserve public health, safety, and welfare.

§ 72.202 SCOPE.

(A) The regulations in this subchapter apply to all residential zoned districts and residential use properties, regardless of zone, within the city.

(B) Nothing in this subchapter is intended to conflict with or supersede regulations in Chapter 156: Zoning, Article E – Parking, Loading, and Stacking. All applicable developments or use changes must meet §156.E. Properties that have applied for and been approved for Limited Use Permit, Special Use Permit, Variance, or other zoning-related requirements and waivers shall govern if a conflict in parking requirements are specifically listed and included in the permit or variance approved.

§ 72.203 DRIVEWAYS; NUMBER, COMPOSITION, LOCATION AND SIZE.

(A) Composition of the driveway and entrance surface. Under this subchapter, a driveway and entrance shall be a surface constructed of materials as follows:

	Allowable Driveway Approach Materials	**Allowable Front Yard / Side Street Front Yard Driveway & Extension Materials**	**Allowable Rear and Side Yard Driveway & Extension Materials**
Driveways Installed prior to 2010 & Continuously Maintained	Concrete, Asphalt, Seal Coat, Solid Bricks, Gravel, or Crushed Stone	Concrete, Asphalt, Seal Coat, Solid Bricks, Gravel, or Crushed Stone	Concrete, Asphalt, Seal Coat, Solid Bricks, Gravel, or Crushed Stone
Driveways Installed after 01/01/2010 and prior to 10/01/2024	Concrete, Asphalt, or Solid Bricks	Concrete, Asphalt, or Solid Bricks	Concrete, Asphalt, Seal Coat, Solid Bricks, Gravel, or Crushed Stone
Driveways Installed on or after 10/01/2024	Concrete (shall be a minimum of 6 inches) or Asphalt (shall be an equivalent strength)	Concrete, Asphalt, or Solid Bricks	Concrete, Asphalt, Seal Coat, or Solid Bricks. Exception: Gravel or Crushed Stone shall be allowed if directly connected through the driveway to a gravel street, gravel alley, or grassed alley.

Driveways shall be maintained in quality, quantity, and size to prevent the creation of ruts in or deterioration or damage to the driveway or soil beneath from the operation or parking of vehicles, recreational vehicles, or trailers.

(B) Location of driveway or parking areas.

(1) *Front yard*.

a. Only one driveway shall be allowed in a front yard per street frontage, except that a duplex with garages located at each end of the building shall be permitted a driveway for each garage.

b. No driveway shall be located in front of a dwelling, except for any dwelling area portions attached to and located above or behind a garage.

c. A driveway shall not lead perpendicularly to the side of a garage where there is no garage door.

d. A driveway shall be connected and lead to only one curb drop or entrance, except for residences on a corner lot located on a major or minor arterial or major collector roadway, as defined in the city's Comprehensive Plan and any future amendments to the plan, which can apply to the City Engineer for permission to connect a driveway to two curb drops for the sole purpose of allowing safe entry onto the roadway.

(2) Additional Requirements

a. Parking of all vehicles, recreational vehicles, and trailers, must be in a permanent roofed structure or on a driveway or driveway extension meeting the materials allowed in section § 72.203.

b. Driveway and parking areas must be connected to a driveway leading from an approved curb drop or entrance.

c. The maximum number of vehicles, recreational vehicles, and trailers, allowed to be parked at one time on a parcel outside of a permanent roofed enclosure shall be as follows:

i. Dwelling, Single-Family Attached; Dwelling, Single-Family Detached; Dwelling, Duplex; Dwelling, Townhouse; and Dwelling, Multiplex:

1. Maximum quantity shall be in accordance with § 156.E.004.
2. Any vehicle, trailer, or recreational vehicle longer than 30-feet in length shall count as two.
3. There shall be a maximum of two trailers.

ii. Dwelling, Apartment:

1. Maximum quantity shall be in accordance with § 156.E.004.
2. Any vehicle, trailer, or recreational vehicle longer than 30-feet in length shall count as two.

(3) The vehicle, trailer, or recreational vehicle wheels and any component touching the ground must be located entirely on surfacing in accordance with § 72.203.A.

(4) *Maintenance*.

a. Existing gravel or crushed stone must be maintained and have a minimum of 4 inches of depth, to be free from weeds and grass and to a depth to prevent erosion and rutting.

b. All other surfaces must meet the requirements of division (A) above.

(C) *Width of driveway*.

(1) The maximum width of a driveway shall be based on the vehicle stall count of the permanent roofed vehicle enclosure (garage) and be no wider than the following:

No connected garage	10 feet (plus a maximum of one driveway extension)
1 vehicle stall wide garage	12 feet (plus a maximum of one driveway extension)
2 vehicle stall wide garage	24 feet (plus a maximum of one driveway extension)
3 vehicle stall wide garage	24 feet (plus a maximum of one driveway extension)
4 stall garages and larger	All 4-vehicle stall wide garages and larger shall be placed on the lot so all the garage doors do not face the primary street. Some or all of the doors shall be perpendicular to the street. The driveway width in the front yard shall not be greater than 24 feet, plus a maximum of one driveway extension

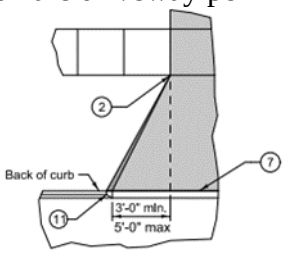
(2) The driveway width shall be measured at the property line, as shown in the following exhibit.

(3) In cases where the garage is more than four feet wider than the edge of a garage overhead door, the Engineering Office shall have the discretion to reclassify the stall count or allow driveway tapering. All approvals shall be noted on the driveway permit.

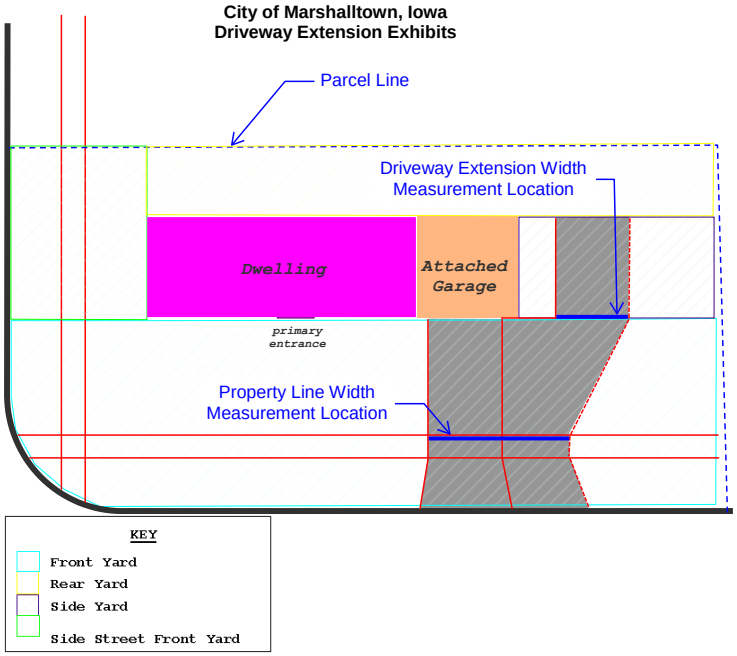
(4) A driveway extension shall be a maximum width of 10 feet. If a driveway extension runs past the front face of the dwelling or garage as a driveway extension, the driveway extension's maximum width shall be measured perpendicular to the driveway extension at the location where the extension passes the front face, as shown in the following exhibit.

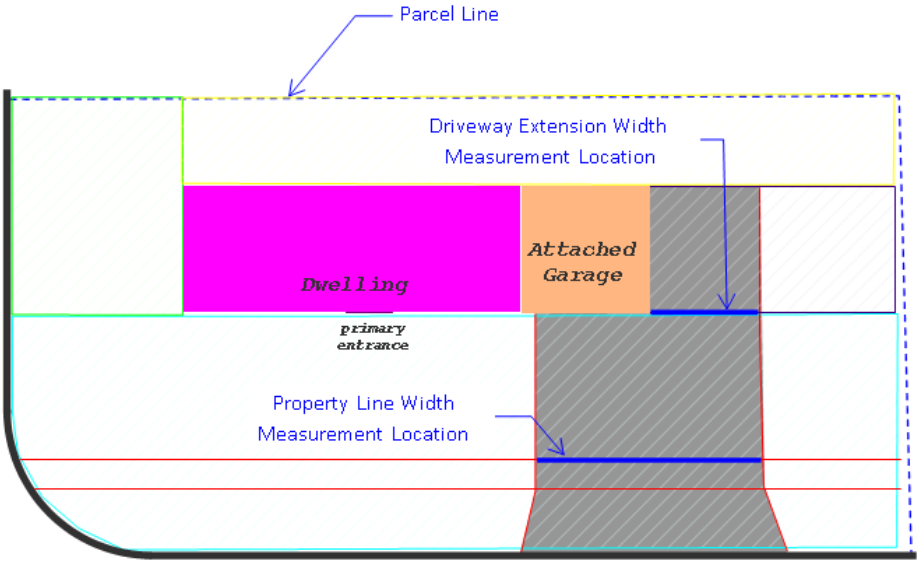
(5) In situations where a driveway extension is located along the side of a structure with a roof overhang that causes conflict between vehicles, trailers, or recreational vehicles, the driveway extension may be increased in width by the amount of the roof overhang, up to four feet. Driveway extension tapering or width changes shall be utilized to reduce the allowable width back to the requirements, as documented on the driveway permit.

(6) A curb cut or entrance may flare out between the property line and an approved entrance or curb cut in accordance with Marshalltown Supplementary Specifications to SUDAS, so long as not to cross a property line without written/recorded permission from the adjacent property owner. For Reference Only (SUDAS 2024 allows 3-5' flare)



DETAIL A
(Residential/Agricultural Only)





(D) *Exemption for large lots*. Residential lots greater than one-half acre and with a front yard depth greater than 75 feet are exempt from the provisions of division (B) above and § 72.204 of this chapter, with the exception of paving requirements. A driveway permit application is required to be submitted and approved by the city to verify that the lot qualifies as a large lot. The driveway width at the property line shall not be greater than 24 feet with no opportunity for a driveway extension.

(E) *Exemption for approved planned unit developments (PUD)*.

(1) Residential PUDs that have been approved by the Plan and Zoning Commission and the City Council are exempt from the provisions of divisions (B) and (C) above and § 72.204 of this chapter only if driveway regulations are included in the approved PUD plans.

(2) All front yard driveways and driveway extensions must be paved in accordance with divisions (A) and (B) above.

(F) *Responsibilities of owners*. Any person, corporation, or legal entity who is the owner, whether the legal or equitable titleholder, of a residential lot, shall be responsible for any violation of the driveway regulations provided in divisions (A), (B), and (C) above.

(G) Reasonable variations from these requirements may be approved by the City Engineer and the Planning Department jointly for unforeseen situations or unusual property configurations.

Penalty, see § 72.999

§ 72.204 DRIVEWAY EXTENSIONS IN FRONT YARDS; EXCEPTIONS.

(A) (1) Prior written authorization of the Engineering Department or other authorized designee is required for all driveways and driveway extensions in front yards and regulations for authorization. No driveway extension shall be installed or construction thereon begun in any residential front yard without the prior written authorization of the Engineering Department or other authorized designee, issued to the owner, whether the legal or equitable title holder, of the lot.

(2) Prior to the Engineering Department or other authorized designee's consideration of any request for or issuance of a written authorization for any driveway or driveway extension in any

residential front yard, any owner, whether the legal or equitable title holder, of the lot, shall submit a written application and pay to the City Clerk a fee set by resolution.

(3) The Engineering Department or other authorized designee shall issue a written authorization for a driveway extension in a residential front yard to an owner, whether the legal or equitable title holder, of a residential lot, upon submission of an application by the owner and payment of the fee therefor and only if a proposed driveway extension will comply with all of the following, which shall be specified in writing in each written authorization issued:

(a) One driveway extension no wider than ten feet in width shall be permitted in a front yard;

(b) A driveway extension must be contiguous and parallel to the driveway;

(c) A driveway extension must be located between the driveway and the side property line in the direction away from the dwelling if there is sufficient space for placement between the driveway and that side property line; and

(d) The surface of a driveway extension must be a surface material allowed in section § 72.203 and constructed and maintained in quality, quantity, and size to prevent the creation of ruts in or deterioration or damage to the driveway extension or soil beneath from the operation or parking of vehicles, recreational vehicles or trailers.

(4) Any person, corporation, or legal entity who is the owner, whether the legal or equitable title holder, of a residential lot, shall be responsible for any violation of this section pertaining to driveways or driveway extensions.

(B) (1) The following driveways and driveway extensions, in existence on or before 2-26-2001, are excepted or grandfathered from any of the regulations in § 72.203 of this chapter and division (A) above that would otherwise prohibit them:

(a) Driveway extensions that otherwise conform to the driveway extension regulations prescribed by divisions (A)(3)(a), (A)(3)(b), (A)(3)(c), and (A)(3)(d) above without the necessity for Engineering Department or other authorized designee for a driveway extension that is located on the side of the driveway towards the dwelling, regardless if there exists sufficient space to have located the extension on the side of the driveway in the direction away from the dwelling;

(b) Driveways connected and leading to one or two approved existing curb cuts or entrances, which is in the nature of a circle-type or horseshoe-type driveway, whether located in front of a dwelling that otherwise conforms to the driveway regulations prescribed by § 72.203 of this chapter; or

(c) Driveways connected and leading to only one entrance from a street or alley, although the entrance has not been authorized and approved by the city, that otherwise conforms to the driveway regulations prescribed by § 72.203 of this chapter.

(2) The grandfather exceptions provided in this section shall automatically terminate for any driveway or driveway extension that is replaced, altered, or expanded on or after 2-26-2001. However, maintenance, without changing the configuration, of a grandfathered driveway or driveway extension will not terminate its grandfathered status.

Penalty, see § 72.999

§ 72.205 RESIDENTIAL PARKING.

(A) *Residential parking off driveway or driveway extension prohibited*. It shall be unlawful for any person, corporation, or legal entity to park a vehicle, trailer, or recreational vehicle in the yard of any residential lot unless the vehicle, trailer, or recreational vehicle is parked completely upon a driveway, driveway extension, or combination thereof, a parking pad meeting the requirements

of Section 72.205(B), or in a permanent roofed enclosure. However, this section shall not apply to vehicles, trailers, or recreational vehicles being used to move, deliver, and/or take articles to and from a yard or building or structure located thereon or used in connection with providing a temporary service thereon for a reasonable period of time while in the active process of such use.

(B) *Parking Pad.* A residential property is allowed one parking pad not connected to a driveway provided the following conditions are met:

1) Size. The parking pad shall be no larger than 324 sf. Additionally, the combination of any accessory structure and parking pad shall not exceed what would be allowed by the lesser of the maximum footprint/floor area as shown in Table 156.C.007-1, Accessory Structure Dimensional Requirements.

2) Material. The parking pad shall be concrete, asphalt, or solid brick/pavers.

3) Setbacks. Unconnected parking pads shall not be located in front, side street, or side yards; they must be entirely in the rear. They shall have a minimum of five-feet setback from all property lines.

4) Separation. No parking pad shall be located closer than five feet to any other structure on three sides of the pad. One side of the pad may be adjacent to a structure on the property.

5) Commercial use. Parking pads located on residentially zoned or used property shall not be used for commercial purposes or for the storage of commercial vehicles or equipment, other than home occupations that comply with Chapter 156.

6) License/Registration. Any vehicle, trailer, or recreational vehicle parked on the parking pad shall be licensed or registered by the property owner or tenant.

7) Access Route. The access route to the parking pad shall be maintained with vegetation establishment without ruts. Wear marks from tire tracks that are bare from vegetation shall not be allowed.

8) Easements. Any parking pad placed within an easement, if allowed, shall be the property owner's sole risk, financial obligation, and maintenance responsibility to remove, repair, or replace in the event the easement holder removes or damages the pad.

(C) Parking of trucks, other than panel or pickup trucks of less than or equal to one-ton chassis capacity, is prohibited in residential areas, except to load/unload. Heavy commercial vehicles (including tractor-cab units rated over one ton) shall not be parked at any time in residential zoning districts except when work is being performed on that property.
Penalty, see § 72.999.

§ 72.206 UNLICENSED, INOPERABLE VEHICLES.

(A) It shall be unlawful for any person, corporation, or legal entity to park or store an unlicensed or inoperable vehicle, trailer, or recreational vehicle anywhere in the front, side, side street front, or rear yard, including upon any driveway or driveway extension unless the vehicle, trailer, or recreational vehicle is parked or stored in a permanent roofed enclosure. Mere licensing of an inoperable vehicle shall not constitute a defense to the finding that such vehicle violates this section.

(B) Nuisance vehicle removal, storage, redemption, or disposal regulations are outlined in § 95.010.
Penalty, see § 72.999.

§ 72.207 RESPONSIBILITY FOR VIOLATIONS.
When the identity of the operator of a vehicle, trailer, or recreational vehicle cannot be determined, any person, corporation, or legal entity who was the registered owner of such vehicle, trailer, or recreational vehicle and any person, corporation, or legal entity who was in lawful possession of the residential lot where the violation occurred at the time of a violation shall be held prima facie responsible for any violation of the provisions of §§ 72.205 and 72.206 of this chapter.

§ 72.208 NO PRIOR NOTICE, WARNING REQUIRED.
The offenses enumerated in this subchapter do not contain elements that require any prior notice or warning to be given to an offender regarding any offense.

PARKING ON BUSINESS PROPERTIES

§ 72.301 PURPOSE.
(A) The purpose of the business parking regulations in this subchapter is to prevent the unreasonable diminishing or impairment of established property values and aesthetics within the city and to preserve public health, safety, and welfare.

§ 72.302 SCOPE.
(A) The regulations in this sub-chapter apply to all commercial-zoned districts and business-use properties, in a residential zone, within the city.
(B) Nothing in this sub-chapter is intended to conflict with or supersede regulations in Chapter 156: Zoning, Article E – Parking, Loading, and Stacking. All applicable developments or use changes must meet § 156.E. Properties that have applied for and been approved for Limited Use Permit, Special Use Permit, Variance, or other zoning-related requirements and waivers shall govern if a conflict in parking requirements is specifically listed and included in the permit or variance approved.

72.303 DRIVEWAYS AND PARKING
(A) *Composition of driveway and entrance surface.* Under this sub-chapter, a driveway and entrance shall be a surface constructed of materials per table 72.203 (A). Driveways shall be maintained in quality, quantity, and size to prevent the creation of ruts in or deterioration or damage to the driveway or soil beneath from the operation or parking of vehicles, trailers, recreational vehicles, or any thereon. Existing gravel or crushed stone must be maintained and have a minimum of 6 inches of depth, and be free of weeds and grass
(B) Location of driveway and parking.
(1) Front yard.
a. Parking of all vehicles, recreational vehicles, and trailers, must be parked in a permanent roofed structure or on a driveway meeting the materials allowed in section § 72.303 or applicable sections of § 156 Zoning.

b. Only one driveway shall be allowed in a front yard per street frontage except where the driveway was approved as part of a parking lot.

c. No driveway shall be located in front of a dwelling unless it is the entrance to an approved parking lot.

d. A driveway shall not lead perpendicularly to the side of a garage where there is no garage door.

e. A driveway shall be connected and lead to only one curb drop or entrance, except for businesses on a corner lot located on a major or minor arterial or major collector roadway, as defined in the city's Comprehensive Plan and any future amendments to the plan, which can apply to the City Engineer for permission to connect a driveway to two curb drops for the sole purpose of allowing safe entry onto the roadway.

(2) Rear and side yards.

a. Parking of all vehicles, including licensed and operable vehicles, recreational vehicles, and trailers, must be parked in a permanent roofed structure or on a driveway meeting the materials allowed in section § 72.303 or applicable sections of § 156 Zoning.

b. Driveway and parking areas in a side-yard or rear-yard must be connected to a driveway leading from an approved curb drop or entrance.

(3) Exceptions

a. For businesses with a majority of sales being agricultural products or equipment and the lot(s) owned by the business site total over four acres, the product or equipment for sale may be displayed on grass or gravel.

b. For a group gathering (party, club, reception, meeting, community event, etc.) an unlimited number of vehicles may be parked anywhere on a lot for a maximum of eight hours but not overnight

c. Marshall County Fairgrounds shall be exempted from these regulations.

§ 72.304 UNLICENSED, INOPERABLE VEHICLES: It shall be unlawful for any person, corporation, or legal entity to park or store an unlicensed or inoperable vehicle anywhere unless it is parked or stored in a permanent roofed enclosure or allowed by § 156: Zoning, Mere licensing of an inoperable vehicle shall not constitute a defense to the finding that such vehicle violates this section.

§ 72.305 RESPONSIBILITY FOR VIOLATIONS: When the identity of the operator of a vehicle cannot be determined, any person, corporation, or legal entity who was the registered owner of such vehicle and any person, corporation, or legal entity who was in lawful possession of the lot where the violation occurred at the time of a violation may be held prima facie responsible for any violation of this subchapter.

§ 72.306 NO PRIOR NOTICE, WARNING REQUIRED: The offenses enumerated in this subchapter do not contain elements that require any prior notice or warning to be given to an offender regarding any offense.

SPECIAL STOPS

§ 72.401 RAILROADS; OBEDIENCE TO SIGNALS; CROSSINGS

(A) *Obedience to signal of a train*.

(1) Whenever any driver approaches a railroad grade crossing and warning is given by automatic signal or crossing gates or a flag person or otherwise of the immediate approach of a train, the driver shall stop within 50 feet, but not less than 15 feet from the nearest track of such railroad and shall not proceed until they can do so safely.

(2) The driver shall stop and remain standing and shall not traverse such a grade crossing when a crossing gate is lowered or when a human flag person gives or continues to give a signal of the approach or passage of a train.

(B) *Stopping at a railroad crossing*. The driver approaching a railroad grade crossing across which traffic is regulated by a stop sign, a railroad sign directing traffic to stop or an official traffic control signal displaying a flashing red or steady circular red colored light shall stop before crossing the railroad at the first opportunity at either the clearly marked stop line or at a point near the crossing where the driver has a clear view of the approaching railroad traffic.

(C) *Certain vehicles, trailers, or recreational vehicles required to stop at railroad crossings*.

(1) (a) A driver carrying passengers for hire, a school bus or a vehicle carrying hazardous material and required to stop before crossing a railroad track by motor carrier safety rules adopted under I.C.A. § 321.449, before crossing at grade any track of a railroad, shall stop within 50 feet, but not less than 15 feet from the nearest rail.

(b) While stopped, the driver shall listen and look in both directions for an approaching train and signals indicating the approach of a train and shall not proceed until the driver can do so safely.

(2) No stop needs to be made at a crossing where a peace officer or a traffic control device directs traffic to proceed. No stop need be made at a crossing designated by an “exempt” sign. An exempt sign shall be posted only where the tracks have been partially removed on either side of the roadway.

(D) *Heavy equipment at railroad crossing*.

(1) No person shall operate or move any caterpillar tractor, steam shovel, derrick, roller, or any equipment or structure having a normal operating speed of six or less mph or a vertical body or load clearance of less than nine inches above the level surface of a roadway upon or across any tracks at a railroad grade crossing without first complying with this section.

(2) Notice of any such intended crossing shall be given to a superintendent of such railroad, and a reasonable time shall be given to such railroad to provide proper protection at such crossing.

(3) Before making any such crossing, the person operating or moving any such vehicle or equipment shall first stop the vehicle or equipment not less than ten feet or more than 50 feet from the nearest rail of such railway and while so stopped shall listen and look in both directions along such track for any approaching train and signals indicating the approach of a train and shall not proceed until the crossing can be made safely.

(4) No such crossing shall be made when a warning is given by automatic signal or crossing gates or a flag person or otherwise of the immediate approach of a railroad train or car.

Penalty, see §10.999. Statutory reference: Similar provisions, see I.C.A. §§ 321.341 through 321.344.

§ 72.402 PRIMARY ROADS DESIGNATED AS THROUGH HIGHWAYS.

Primary roads and extensions of primary roads within the city are designated as through highways.

Statutory reference: Similar provisions, see I.C.A. § 321.350.

§ 72.403 EMERGING AND YIELDING WHEN EMERGING FROM PRIVATE ROADWAY, ALLEY, BUILDING OR DRIVEWAY.

The driver of a vehicle emerging from a private roadway, alley, driveway, or building shall stop such vehicle immediately before driving onto the sidewalk area and, thereafter, the driver shall proceed into the sidewalk area only when the driver can do so without danger to pedestrian traffic, and the driver shall yield the right-of-way to any vehicular traffic on the street into which the driver's vehicle is entering.

Penalty, see § 71.999

HABITUAL VIOLATOR PENALTY AND PROCEDURES

§ 72.501 HABITUAL VIOLATOR.

(A) For the purposes of this subchapter, a Notice of Parking Violation that has not been paid within 60 days of the violation date is considered delinquent.

(B) Any person who has five or more delinquent Notice of Parking Violations issued on a vehicle, trailer, or recreational vehicle or registration plate shall be deemed a habitual violator.

(C) No person shall park a vehicle, trailer, or recreational vehicle and permit it to remain standing upon any public street or municipal lot in the city when there are five or more delinquent Notice of Parking Violations outstanding against that vehicle or registration plate.

(D) A violation of this section shall place such vehicle, trailer, or recreational vehicle in the status of an illegally parked vehicle, and the vehicle, trailer, or recreational vehicle may be dealt with according to § 72.502 of this chapter.

Penalty, see § 72.999.

§ 72.502 REMOVAL AND IMPOUNDMENT OF ILLEGALLY PARKED VEHICLES.

The Police Department or Parking and Code Enforcement Officer may remove and impound vehicles, trailers, or recreational vehicles that are stopped or parked in violation of this chapter or other city ordinances and, in so doing, may employ such means as are reasonably necessary. Impounded vehicles, trailers, or recreational vehicles shall be stored in a location designated by the city.

§ 72.503 RIGHT OF OWNER TO REDEEM IMPOUNDED VEHICLE.

(A) The registered owner or person having a legal entitlement to possession of a vehicle, trailer, or recreational vehicle impounded pursuant to § 72.502 of this chapter may claim said vehicle by paying the associated city fees and the towing contractor fees for all charges attributable to the impoundment and storage of the vehicle, trailer, or recreational vehicle.

(B) If a hearing pursuant to § 72.505 of this chapter is held and a Hearing Officer determines there was no probable cause to impound the vehicle, the costs attributable to the impoundment shall be refunded upon the presentation to the city's Finance Director of:

(1) A certificate of no probable cause issued by the city; and

(2) The receipt for payment of charges attributed to the impound and storage.

(C) If a vehicle, trailer, or recreational vehicle was impounded pursuant to § 72.501 of this chapter, all delinquent Notice of Parking Violations must be satisfied. An administrative fee of $50 will be required, payable to the City of Marshalltown.

(D) If the vehicle, trailer, or recreational vehicle is not claimed until after a hearing requested pursuant to § 72.504 of this chapter, the vehicle, trailer, or recreational vehicle may be claimed upon:

(1) Payment of all charges referred to in § 72.505 of this chapter; or

(2) Presentation of a certificate of no probable cause within two working days of its issuance to the party in possession of the vehicle, trailer, or recreational vehicle.

(E) Failure to timely present such a certificate will result in assumed liability on the part of the owner or person having legal entitlement to possession of the vehicle, trailer, or recreational vehicle for all related towing and storage charges.

§ 72.504 RIGHT TO HEARING.

(A) The registered owner or person having legal entitlement to possession of a vehicle, trailer, or recreational vehicle impounded pursuant to this subchapter has a right to a post-seizure administrative hearing before a Hearing Officer designated by the City Administrator, to determine whether there was probable cause to impound the vehicle, trailer, or recreational vehicle and any personal property contained within; provided, the registered owner or person having legal entitlement to possession files a written demand with the City Clerk's office within five business days from the date of the impoundment. A copy of this subchapter shall be given to the person requesting a hearing.

(B) Failure to request a hearing within five business days or to attend a scheduled post-seizure hearing shall be deemed a waiver of the right to such a hearing.

§ 72.505 CONDUCT OF HEARING.

(A) The post-seizure administrative hearing held under this subchapter shall be conducted before the Hearing Officer designated by the City Administrator within a reasonable period of time, but not to exceed 15 business days from the date of receipt of a written demand. Such hearing may be continued for good cause. The sole issue before the Hearing Officer shall be whether there was probable cause to impound the vehicle, trailer, or recreational vehicle and personal property contained within the vehicle, trailer, or recreational vehicle in question. The department causing the vehicle, trailer, or recreational vehicle to be impounded shall carry the burden of establishing that there was probable cause to impound the vehicle, trailer, or recreational vehicle in question. The Hearing Officer shall decide only that either there was or was not probable cause to impound the vehicle, trailer, or recreational vehicle and contents. If the Hearing Officer determines there was probable cause to impound the vehicle, trailer, or recreational vehicle and contents, the registered owner or person having a legal entitlement to possession of the vehicle, trailer, or recreational vehicle is responsible for payment of all charges attributable to the impoundment and storage of the vehicle, trailer, or recreational vehicle and the costs of the administrative hearing. If the Hearing Officer determines there was no probable cause, the Hearing Officer shall prepare a certificate of no probable cause and the charges paid shall be refunded pursuant to § 72.503 of this chapter.

(B) The proceedings at the administrative hearing shall be recorded by the Hearing Officer. Such recording shall serve as the official record of the administrative hearing. The City Clerk shall retain all such recordings until the retention period has expired.

(C) The decision of the Hearing Officer shall be final and in no way affect any criminal proceeding in connection with the impoundment in question.

(D) Criminal charges, if any, may only be challenged in the appropriate court.

§ 72.999 PENALTY.

(A) (1) The penalty for violating any alternate, sidewalk, terrace, overtime parking, over line, blocking drive, not a space, parked 24 hours, parked 48 hours, no parking 2:30-5:30 AM, no parking anytime, left side to curb, yellow curb, 18" from curb, here to corner, permit violation, occupy 2 parking spaces, or here to alley parking provisions shall be a fine of $20 if paid within 30 days of the violation. The penalty for violating snow ordinance parking provisions shall be a fine of $25 if paid within 30 days of the violation. The penalty for violating fire lane and yard parking provisions shall be a fine of $30 if paid within 30 days. The penalty for violating disabilities parking provisions shall be a fine of $100.

(2) A late fee of $5 shall be assessed to any Notice of Parking Violation that is not paid within 30 days of the violation date with the exception of disabilities parking violations.

(3) Fines shall not be paid in pennies. Payment of fines may be made by depositing the money in the Notice of Parking Violation envelope provided and dropping in the courtesy payment box located at City Hall or the Police Department, by paying in-person at City Hall, or by mailing the fee in the envelope provided with sufficient U.S. postage.

(4) Each subsequent hour that the vehicle, trailer, or recreational vehicle shall remain improperly parked after each summons is issued shall constitute a new and separate violation and shall incur the same penalty.

(5) If sufficient U.S. postage is not affixed when the citation is mailed such penalty shall be $5.

(6) To contest a Notice of Parking Violation you must personally appear at the police department within 30 days for processing of a Court Citation and shall be subject to such costs as determined by the court.

(7) A vehicle registration hold may be placed on a vehicle with a delinquent Notice of Parking Violation. All fines must be paid before a registration hold is released. Further collection efforts may be taken by submitting delinquent fines to the State of Iowa Setoff Program for collection from State tax refunds.

(C) (1) Composition, location, and size of driveways and driveway extensions. Any person, corporation, or legal entity who is the owner, whether the legal or equitable title holder, of a residential lot who violates any of the regulations for the composition, location, or size of driveways and driveway extensions contained in this chapter may be charged either with a simple misdemeanor, which, upon conviction, is punishable pursuant to § 10.999(A) of this code of ordinances or a municipal infraction, which, upon judgment entered against a defendant, is punishable by the civil penalties and subject to the remedies defined in I.C.A. § 364.22 or any amendments thereto.

(2) Number of parked vehicles, trailers, or recreational vehicles. Any person, corporation, or legal entity who is the owner, whether the legal or equitable title holder, of a residential lot who violates any of the regulations for the number of parked vehicles, trailers, or recreational vehicles contained in this chapter may be issued a Notice of Parking Violation or charged with either a simple misdemeanor for subsequent offenses, which, upon conviction, is punishable pursuant to § 10.999(A) of this code of ordinances; or a municipal infraction, which, upon judgment entered against a defendant, is punishable by the civil penalties and subject to the remedies defined in

I.C.A. § 364.22 or any amendments thereto. Each day that a violation occurs or is permitted to exist constitutes a separate offense, whether charged as a Notice of Parking Violation, simple misdemeanor, or municipal infraction.

(D) Habitual Violators as outlined in 72.501 must pay all delinquent Notice of Parking Violations and the administrative fee of $50 before the City will authorize the release of said vehicle. The violator must then pay all towing and storage fees to the tow company before the release.

Section 3. Repealer. All ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed.

Section 4. Severability Clause. If any section, provision, or part of this ordinance shall be adjudged invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole or any section, provision, or part thereof not adjudged invalid or unconstitutional.

Section 5. When Effective. This ordinance shall be in full force and effect after its final passage, approval, and publication as provided by law.

Passed this _____ day of _____ 2024 and signed this _____ day of _____ 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

I, Alicia Hunter, City Clerk of the City of Marshalltown, Iowa, do hereby certify that the foregoing ORDINANCE was passed and approved by the City Council of the City of Marshalltown, Iowa, on the _____ day of _____ 2024, and was published in the Marshalltown Times-Republican, a newspaper of general circulation in the City of Marshalltown, Iowa, on the _____ day of _____ 2024.

_____

Alicia Hunter, City Clerk

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

MARSHALLTOWN
IOWA

TO: Mayor and City Council
FROM: Heather Thomas, Public Works Director
DATE: October 14, 2024
RE: Ordinance Revision _ Chapter 72: Parking Rules

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: Review policies, procedures, and ordinances for updates.

Recommendation: Adopt first reading of Chapter 72: Parking Rules amendment.

Budget Impact: N/A

Description/Background:

UPDATE 10/14/24
During a discussion item on September 23rd, City Council had further discussions about adding language for an unconnected parking pad and provided majority direction to allow. The following language has been added to the Ordinance Revision for this allowance:

Section 72.205; Replace (A) with the following

(A) *Residential parking off driveway or driveway extension prohibited*. It shall be unlawful for any person, corporation, or legal entity to park a vehicle, trailer, or recreational vehicle in the yard of any residential lot unless the vehicle, trailer, or recreational vehicle is parked completely upon a driveway, driveway extension, or combination thereof, **a parking pad meeting the requirements of Section 72.205(B),** or in a permanent roofed enclosure. However, this section shall not apply to vehicles, trailers, or recreational vehicles being used to move, deliver, and/or take articles to and from a yard or building or structure located thereon or used in connection with providing a temporary service thereon for a reasonable period of time while in the active process of such use.

Insert new Section 72.205 (B), renumber existing (B) to (C)

(B) *Parking Pad.* A residential property is allowed one parking pad not connected to a driveway provided the following conditions are met:

1) Size. The parking pad shall be no larger than 324 sf. Additionally, the combination of any accessory structure and parking pad shall not exceed what would be allowed by the lesser of the maximum footprint/floor area as shown in Table 156.C.007-1, Accessory Structure Dimensional Requirements.
2) Material. The parking pad shall be concrete, asphalt, or solid brick/pavers.
3) Setbacks. Unconnected parking pads shall not be located in front, side street, or side yards; they must be entirely in the rear. They shall have a minimum of five-feet setback from all property lines.
4) Separation. No parking pad shall be located closer than five feet to any other structure on three sides of the pad. One side of the pad may be adjacent to a structure on the property.
5) Commercial use. Parking pads located on residentially zoned or used property shall not be used for commercial purposes or for the storage of commercial vehicles or equipment, other than home occupations that comply with Chapter 156.
6) License/Registration. Any vehicle, trailer, or recreational vehicle parked on the parking pad shall be licensed or registered by the property owner or tenant.
7) Access Route. The access route to the parking pad shall be maintained with vegetation establishment without ruts. Wear marks from tire tracks that are bare from vegetation shall not be allowed.
8) Easements. Any parking pad placed within an easement, if allowed, shall be the property owner's sole risk, financial obligation, and maintenance responsibility to remove, repair, or replace in the event the easement holder removes or damages the pad.

Additionally, city staff have been made aware of public parking lots downtown being used for storage of commercial vehicles/trailers overnight since the city changed parking rules to allow up to 72 hours. City staff propose the following language change to not allow those in public parking lots.

Section 72.116

(B) *Impoundment of vehicles left on municipally-owned parking lots.* Any vehicle parked or left standing on any municipally owned or municipally leased parking lot for longer than 72 continuous hours may be removed therefrom and stored under the direction of the Police Department or Parking and Code Enforcement Officer, and all costs of such removal and storage shall be payable by the operator or owner thereof. Any expense incurred therefor shall be in addition to the assessment of any fine or costs arising out of any violation of this subchapter.

(C) *Impoundment of semi-trucks, construction equipment, trailers, or recreational vehicles left overnight in municipally-owned parking lots*. Any semi-trucks, construction equipment, trailers, or recreational vehicles parked or left standing on any municipally owned or municipally leased parking lot overnight between the hours of 9:00 PM and 5:30 AM, without authorization from the Public Works Department, may be removed therefrom and stored under the direction of the Police Department or Parking and Code Enforcement Officer, and all costs of such removal and storage shall be payable by the operator or owner thereof. Any expense incurred therefor shall be in addition to the assessment of any fine or costs arising out of any violation of this subchapter.

We proposed the following Ordinance Amendment Schedule:

Un-table & Perform 1st Reading: October 14, 2024
2nd Reading: October 28, 2024
3rd Reading: November 11, 2024

From previous Council Meeting Discussions:

The City Council discussed Chapter 72: Parking Rules at the March 11th and March 25th meetings and requested the suggested amendments be reviewed by the Plan and Zoning Commission to cross reference them with Chapter 156 Zoning. Since those initial discussions, the Plan and Zoning Commission has discussed Chapter 72: Parking Rules at multiple meetings to cross reference with the ordinance amendment that was brought forward for revision to Chapter 156 Zoning: Parking, Loading, and Stacking. They recommended moving forward with an ordinance amendment of Chapter 72. The Planning and Zoning Commission's recommendations were brought forward for discussion at the August 26th meeting and for the 1st Reading of an ordinance amendment at the September 9th Meeting.

At the September 9th Meeting, the 1st Reading was tabled and staff were given direction to bring back a discussion item to allow a parking pad. The following are several options for discussion and consideration:

a. From City Council Discussion 03/25/24, the following concept was discussed and presented to the Planning & Zoning Commission, who recommended not allowing a parking pad:
   A maximum of two parking pad spaces may be created per parcel without connection to a driveway, curb drop, or entrance for seasonal or temporary parking of licensed and operable vehicle that is not moved or driven off the parking pad more than 6 times annually and does not create ruts in the yard exceeding ½-inch as a result. The parking pad shall meet materials allowed in section § 72.038 and not be larger than 12-ft x 24-ft for each pad. Stand-alone parking pads shall not be closer than five feet to any established property line.

b. Not allow (no changes to proposed Chapter 72) based on Plan & Zoning Commission recommendation prohibiting unconnected parking pads.

c. From City Council Discussion 09/09/24, the following ideas were mentioned:
   1. Allow non-connected parking pad on lots over 1-acre.
   2. Access to parking pad shall be maintained without ruts.
   3. Commercial vehicles prohibited from parking on the parking pad.
   4. Maximum parking pad size: 12' x 24'.
   5. Reduce lot requirement size to 0.5-acre.
   6. Use square-feet size requirements in lieu of dimensions.
   7. Consider square foot allowance based on lot size (*after meeting*)

As city staff reviewed these, we decided the best path forward was to present potential language to allow a parking pad option within Chapter 72 and have council provide final direction whether to proceed with the change or hold to the P&Z recommendation to not allow unconnected parking pads.

One of the comments we received was to treat it similar to zoning code's allowable accessory structure size. From Chapter 156, below is the table that outlines those requirements. The maximum floor area is larger than what staff would want to allow a parking pad, so the maximum footprint of 30% as a percentage of the permitted yard would be what would be considered comparable.

Table 156.C.007-1, Accessory Structure Dimensional Requirements						
Housing Type	***Lot Size***	Max. Footprint [1]	***Maximum Floor Area***	Minimum Setback[2]	***Max. Wall Height***	***Max. Structure Height***
Single-Family and Duplex Residencies	0.5 acre or less	30%	1,000 s.f.	5 ft.	10 ft.	15 ft.
	0.5 - 1 acre	30%	1,600 s.f.	5 ft.	12 ft.	15 ft.
	1 - 5 acres	30%	3,000 s.f	5 ft.	12 ft.	20 ft.
	5 acres or more	30% plus	5,000 s.f. plus 1,000 s.f. per acre over 5 acres not to exceed 10,000 s.f.	10 ft.	14 ft.	20 ft.
Multi-family Residencies (Multiplex, Townhouse, Apartment)	Any Size	30%	300 s.f. per unit	10 ft.	10 ft.	15 ft.

TABLE NOTES:

[1] Calculated as a percentage of the permitted rear yard.

[2] Minimum setback from property lines when structure located entirely in the rear yard. Refer to §156.C.007(E) for setback on corner lots.

City staff feel that unconnected parking pads should not be allowed in front yards nor side street front yards. City staff have some hesitation to allow parking pads in side yards. Our concern would be that a property owner be tempted regularly use that and the path driven on would essentially become a grass driveway, which is not allowed by code. Options would be to prohibit side yard parking pads (accessory structures are allowed within side yards but must meet primary structure setback requirements) or only allow on properties that have an existing driveway.

As far as size goes, if the intent would be to allow a camper or trailer – a 12 ft x 24 ft should be adequate for a large single item. We do like the idea of square footage in lieu of dimensions. 12 ft x 24 ft is 288 square feet. 288 square feet is also 16 x 18 ft. It is large enough for two small vehicles/trailers. A standard parking stall is 9 ft x 18 ft, so it would not allow for two larger vehicles. {18 ft x 18 ft is 324 square feet}

Example A)
47.5 ft x 180 ft Lot (8,550 sf or 0.20 acres)
Rear Yard is ~103 ft x 47.5 ft or 4,892.5 sf
30% of rear yard is 1,467 sf; therefore, for accessory structures the 1,000 sf would govern.

Figure 1: Example A

Example B)
75 ft x 56 ft Lot (4,200 sf or 0.10 acres)
Rear Yard is ~12.5 ft x 75 ft or 937.5 sf
30% of rear yard is 281 sf; however, limited space in rear yard if 5' required setback would make it have to go in side yard, if allowed at all

Figure 3: Example B

Example C)
50 ft x 100 ft Lot (5,000 sf or 0.11 acres)
Rear Yard is 52 ft x 50 ft or 2,600 sf
30% of rear yard is 780 sf
There is an existing accessory structure 12 ft x 18 ft (216 ft)

Figure 2: Example C

Figure 4: Example D

Example D)
60 ft x 100 ft Lot (6,000 sf or 0.14 acres)
Rear Yard is 9 ft x 100 ft or 900 sf
30% of rear yard is 270 sf
There is an existing accessory structure located in both side/year yard:16 ft x 18 ft (288 ft)
If 5' required setback would make it have to go in side yard, if allowed at all

In reviewing the smaller parcels, city staff feel that utilizing the square foot / size of the parcel may not be a good check box to use whether it is allowed or not. There are some 0.11-acre parcels that it would be

okay, but there are some that it would look like the lot is packed with a house, a detached garage, and a parking pad, but nothing else.

City staff are also cognizant that some of the properties that struggle with having places to park their vehicles, especially some that may not get used frequently, are the smaller properties in town. The larger properties may have more ability for connected driveways.

If council wishes to proceed, city staff would offer the following language for consideration [insert in Section 72.025, between A and B; and add language to A that parking pad is also allowed for parking on]

(B) Parking Pad. A residential property is allowed one parking pad not connected to a driveway provided the following conditions are met:

a) Size. The parking pad shall be no larger that 288 sf [or 324 sf].

b) Material. The parking pad shall be concrete, asphalt, or solid brick/pavers.

c) Setbacks. Unconnected parking pads shall not be located in front, side street, or side yards; they must be entirely in the rear. They shall have a minimum of five-feet setback from all property lines.

d) Separation. No parking pad shall be located closer than five feet to any other structure on three sides of the pad. One side of the pad may be adjacent to a structure on the property.

e) Commercial use. Parking pads located on residentially zoned or used property shall not be used for commercial purposes or for the storage of commercial vehicles or equipment, other than home occupations that comply with Chapter 156.

f) Access Route. The access route to the parking pad shall be maintained with vegetation establishment without ruts. Wear marks from tire tracks that are bare from vegetation shall not be allowed.

g) Easements. Any parking pad placed within an easement, if allowed, shall be the property owner's sole risk, financial obligation, and maintenance responsibility to remove, repair, or replace in the event the easement holder removes or damages the pad.

ORDINANCE 15096

ORDINANCE TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA BY AMENDING CHAPTER 77, PARKING SCHEDULES

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA:

Section 1. The Code of Ordinances, City of Marshalltown, Iowa CHAPTER 77 PARKING SCHEDULES, SCHEDULE II – NO PARKING ANYTIME, schedule within Section (A), is hereby amended as follows:

Remove the following lines

Side	***On Street***	***From***	***To***
South	E. Church Street	East line of S. 3rd Avenue	A point 60 feet east of east line of S. 4th Avenue
North	E. Church Street	S. 3rd Avenue	S. 5th Avenue
North	E. Linn Street	S. Center Street	S. 3rd Avenue

Insert the following line

Side	***On Street***	***From***	***To***
North	Byron Street	N. 1st Avenue	N. 2nd Avenue
Both	E. Church Street	S. 3rd Avenue	S. 4th Avenue
North	E. Linn Street	S. Center Street	S. 1st Avenue
North	E. Linn Street	Alley between S. 2nd Avenue & S. 3rd Avenue	S. 3rd Avenue

Section 2. The Code of Ordinances, City of Marshalltown, Iowa CHAPTER 77 PARKING SCHEDULES, SCHEDULE IV – COMMUNITY SCHOOL DISTRICT STAFF AND EMPLOYEE PARKING, schedule within Section (A)(1), is hereby amended as follows:

Side	***On Street***	***From***	***To***
West	S. 2nd Avenue	E. Ingledue Street	Koeper Drive
Both	S. 3rd Avenue	E. Olive Street	Rainbow Drive
Both	S. 3rd Avenue	Bobcat Blvd	Pine Street
Both	Koeper Drive	S. 3rd Avenue	S. 2nd Avenue
Both	Olson Way	E. Olive Street	S. 2nd Avenue
Both	Cherry Street	S. 2nd Avenue	S. Center Street
Both	E. Ingledue Street	S. 1st Avenue	S. 3rd Avenue

Section 3. The Code of Ordinances, City of Marshalltown, Iowa CHAPTER 77 PARKING SCHEDULES, SCHEDULE VI – RESTRICTED PARKING, Section (E), is hereby amended as follows:

(E) Exemption.

(1) An exemption parking permit may be requested for any individual residing in the Restricted Parking from 2:30 AM to 5:30 AM area without private parking or public parking access immediately adjoining or directly across an alley or street.

(2) The exemption will allow for parking from 2:30 AM to 5:30 AM on 1st Street, 2nd Street, 1st Avenue, and 2nd Avenue.
(3) Proof of residence is required to be issued a permit by the City Clerk.
(4) The permit must be properly displayed on the bottom corner of the rear driver side windshield.
(5) The exemption is not valid when the snow ordinance is in effect.

Section 4. The Code of Ordinances, City of Marshalltown, Iowa CHAPTER 77 PARKING SCHEDULES, SCHEDULE VII – SNOW REMOVAL; PARKING PROHIBITED, schedule within Section (A)(2), is hereby amended as follows:

Side	***On Street***	***From***	***To***
	All cul-de-sac circles		
Both	Denmead Boulevard	W. Main Street	W. State Street
Both	E. Boone Street	3rd Avenue	4th Avenue
Both	E. North Street	N. Center Street	N. 2nd Avenue
South	E. & W. State Street	N. 3rd Street	N. 3rd Avenue
Both	Highland Drive	5th Street	6th Street
Both	Laurel Drive	S. 15th Avenue	East to dead end
Both	Melody Lane		
Both	N. 12th Street	Fremont Street	Summit Street
Both	N. & S. 1st Avenue	E. Church Street	W. State Street
Both	N. & S. 1st Street	W. Church Street	W. State Street
Both	N. & S. 2nd Avenue	E. Church Street	W. State Street
Both	N. & S. 2nd Street	W. Church Street	W. State Street
Both	N. 5th Avenue	Woodbury Street	Lee Street
Both	N. 6th Street	Highland Drive	Jerome Street
Both	N. 8th Street	Summit Street	State Street
Both	Noble Street	S. 7th Avenue	S. 8th Avenue
Both	Plaza Heights Road	S. 3rd Avenue	Iowa River Hospice
Both	S. 16th Street	W. Church Street	W. Linn Street
East	S. 4th Avenue	E. Church Street	Nevada Street
Both	S. 6th Street	Main Street	Madison Street
All	S. 11th Street - Parking lot	W. Church Street	Boone Street
Both	Walter's Circle	Edgebrook Drive	Cul-de-sac
Both	W. Linn Street	16th Street	A point 861 feet east
Both	Wood Street	S. 7th Avenue	S. 8th Avenue
Both	Young Street		

Section 5. The Code of Ordinances, City of Marshalltown, Iowa CHAPTER 77 PARKING SCHEDULES, SCHEDULE VIII – SNOW ROUTES, schedule within Section (E), is hereby amended as follows:

Street	***Location***
18th Avenue	From Marion Street to Highway 30
E/W Anson Street	From S 2nd Street to S 3rd Avenue
E/W Church Street	From S 9th Street to S 7th Avenue
E/W Linn Street	From S 3rd Street to S 3rd Avenue
E/W Main Street	From Highland Acres Road to N 18th Avenue
E/W Ramps	From S 3rd Avenue to E Madison Street
E/W Southridge Road	From S 6th Street to Governor Road
Edgebrook Drive	From E Southridge Road to E Olive Street
Edgewood Street	From N 3rd Avenue to N 8th Avenue
Governor Road and 12th Avenue	From Iowa Avenue East to Main Street
Iowa Avenue W/E	From the west corporate limits to S 18th Avenue
Marion Street	From N 8th Avenue to N 18th Avenue
N 13th Street	From W Main Street to Summit Street
N 8th Avenue	From Marion Street to Edgewood Street
N/S 3rd Avenue	From E Anson Street to the north corporate limits
N/S Center Street	From the south corporate limits to State Street
S 12th Street	From W Lincoln Way to W Olive Street
S 2nd Street	From W High Street to W Anson Street
S 3rd/6th Street	From W State Street to Iowa Avenue West
S 7th Avenue	From E Main Street to E Church Street
S 9th Street	From W Lincoln Way to W Main Street
Summit Street	From Valley View Road to N 13th Street
W Boone Street	From S 9th Street to S Center Street
W High Street	From S 6th Street to S 2nd Street
W Lincoln Way / Madison Street / Nevada Street	From Highland Acres Road to N 18th Avenue
W Olive Street	From S 12th Street to 18th Avenue

Section 6. The Code of Ordinances, City of Marshalltown, Iowa CHAPTER 77 PARKING SCHEDULES, SCHEDULE IX – DISABLED PARKING, schedule within Section (A), is hereby amended as follows:

Block	***On Street***	***Side***	***Location***
10 W	State Street	South	1st space west of N. Center Street
300 W	Main Street	North	1st and 2nd spaces east of 4th Street
200 W	Main Street	North	1st 2 spaces east of alley
200 W	Main Street	South	1st space east of alley
200 W	Main Street	South	2nd and 3rd spaces east of alley (Sunday only)
100 W	Main Street	North	1st space west of alley

10 W	Main Street	South	1st space east of 1st Street
10 W	Main Street	South	1st space east of alley
10 E	Main Street	North	1st space west of 1st Avenue
100 E	Main Street	North	1st space east of alley
100 E	Main Street	South	1st space west of alley
200 E	Main Street	North	1st space west of alley
300 E	Main Street	South	2nd and 3rd spaces east of 3rd Avenue
10 W	Church Street	South	3rd and 4th spaces west of Center Street (Sunday only)
10 W	Church Street	South	5th space east of Center Street
100 W	Church Street	North	2nd space west of 1st Street
100 E	Church Street	North	1st space west of alley
100 E	Church Street	South	1st space west of South 1st Avenue
200 E	Church Street	North	1st space east of alley
200 E	Church Street	South	1st space east of 2nd Avenue
10 S	1st Street	West	1st space north of Church Street
10 S	4th Street	East	2 spaces, 135 feet and 170 feet south of the south line of W. Main Street
10 N	Center Street	West	1st space south of W. State Street
100 N	Center Street	West	3rd space south of alley
100 N	Center Street	East	6th space north of alley
10 S	Center Street	West	1st space south of alley
10 N	1st Avenue	West	1st space north of Main Street
10 S	1st Avenue	East	1st space south of alley
10 S	1st Avenue	East	1st space north of E. Church Street
10 S	1st Avenue	East	1st space north of Church Street
10 S	2nd Avenue	West	1st and 2nd space south of alley (at 21 S 2nd Street)
100 S	2st Avenue	East	2nd space south of Church Street (at Presbyterian Church)
500 S	3rd Avenue	West	1st 1 space north of Madison Street
500 S	3rd Avenue	East	1st 1 space north of Madison Street
10 N	5th Avenue	East	1 space as signed (Sunday only)
10 S	5th Avenue	East	1st space south of the east/west alley
300S	6th Street	West	1 space as signed
300	Columbus Drive	North	From 145 feet west of Huisman Circle to 70 feet west
	Parking Lot A		2 spaces as signed
	Parking Lot D		1 space as signed
	Parking Lot E		1 space as signed
	Parking Lot F		1 space as signed
	Parking Lot H		3 spaces as signed
	Parking Lot J		3 spaces as signed

	Parking Lot K		1 space as signed
	Parking Lot L		1 space as signed
	Parking Lot N		1 space as signed
	Parking Lot O		1 space as signed
	Parking Lot P		2 spaces as signed
	Parking Lot T		3 spaces as signed
	Parking Lot W		1 space as signed
	Parking Lot Z		1 space as signed

Section 7. The Code of Ordinances, City of Marshalltown, Iowa CHAPTER 77 PARKING SCHEDULES, SCHEDULE X – PUBLIC ACCESS PARKING, schedules (1) and (2) within Section (C), is hereby amended as follows:

(1) Thirty-minute parking.

Street	***Location***
Center Street	West side, between Main Street and State Street, commencing 70 feet north of the north line of the east/west alley, to a point 43 feet north thereof
Main Street	North side, between 1st Avenue and 2nd Avenue, commencing 70 feet east of the east line of 1st Avenue to a point 24 feet east thereof
Main Street	North side, two spaces located 25 feet to 70 feet easterly of 3rd Avenue and three spaces located 115 feet to 185 feet easterly of 3rd Avenue
Main Street	South side, between 3rd Avenue and 5th Avenue the 1st, 4th, 5th and 6th parking spaces as assigned
Church Street	South side, between Center Street and S. 1st Avenue, from the point 31 feet west of S. 1st Avenue to a point 25 feet west thereof
S. 1st Avenue	West side, between Church Street and Linn Street, commencing 70 feet north of the east/west alley, to a point 27 feet north thereof
E. State Street	South side, the first three parking spaces west of the alley between 2nd Avenue and 3rd Avenue
W. State Street	South side, the second and third parking spaces west of N. Center Street

(2) Ninety-minute parking

Street / Lot	***Location***
Parking Lot J	West side, Row of Parallel Parking Stalls

(3) Three-hour parking. Except as shown in division (C)(1) and (C)(2) above and disabled parking as provided in Ch. 77, Schd. IX, division (A), of this traffic code:

Street	***Location***
1st Avenue	From State Street to 280 feet south of Church Street
1st Street	From 180 feet south of Grant Street to Church Street
1st Street	From Church Street to a point 180 feet south
2nd Avenue	From the alley south of State Street to the alley south of Church Street
2nd Street	From Church Street to Main Street
13th Street	Both sides, from Fremont Street to Summit Street
Center Street	From 120 feet south of Grant Street to Linn Street
Church Street	From 3rd Avenue to 2nd Street
Linn Street	South side, from S. Center Street to S. 3rd Avenue
Main Street	From 3rd Avenue to 3rd Street, and the south side of Main Street between 3rd Avenue and 5th Avenue
Main Street	South side between 3rd Avenue and 5th Avenue
State Street	From 3rd Avenue to 3rd Street

Section 8. That this ordinance shall be in full force and effect after its passage and publication as by law and field sign adjustments are made.

Passed this _____ day of _____, 2024, and signed this _____ day of _____, 2024.

CITY OF MARSHALLTOWN, IOWA

_____
Joel Greer, Mayor

ATTEST:

_____
Alicia Hunter, City Clerk

I, Alicia Hunter, City Clerk of the City of Marshalltown, Iowa, do hereby certify that the foregoing ORDINANCE was passed and approved by the City Council of the City of Marshalltown, Iowa, on the _____ day of _____, 2024, and was published in the Marshalltown Times-Republican, a newspaper of general circulation in the City of Marshalltown, Iowa, on the _____ day of _____, 2024.

_____
Alicia Hunter, City Clerk

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

MARSHALLTOWN
IOWA

TO: Mayor and City Council
FROM: Heather Thomas, Public Works Director
DATE: October 28, 2024
RE: Ordinance Revision – Chapter 77: Parking Schedules

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: Review policies, procedures, and ordinances for updates.

Recommendation: Adopt first reading of Chapter 77: Parking Schedules amendment.

Budget Impact: Publication costs and signage revision changes.

Description/Background:

UPDATE 10/28/24

During a discussion item on September 23rd, City Council had further discussions about downtown restricted parking related to the 2:30 AM – 5:30 AM. Council gave direction to add an exemption permit as outlined in the discussion notes from 09/23, shown in later in this memo. This impacts Schedule VI (6) – Restricted Parking and provides the ability to get an exemption permit for the following:

Exemption.

a. An exemption parking permit may be requested for any individual residing in the Restricted Parking from 2:30 am to 5:30 am area without private parking or public parking access immediately adjoining or directly across an alley or street.

b. The exemption will allow for parking from 2:30 am to 5:30 am on 1st Street, 2nd Street, 1st Avenue, and 2nd Avenue.

c. Proof of residence is required to be issued a permit by the City Clerk.

d. The permit must be properly displayed on the bottom corner of the rear driver side windshield.

e. The exemption is not valid when the snow ordinance is in effect.

Additionally, several other changes that have been identified by city staff for this Chapter when the next update came forward are also being recommended. These include:

a. We had a request to review on-street parking near the new Clock Towers Building. The request was to allow on-street parking on Church from 3rd to 5th Ave and along 4th Ave, south of Church Street. Staff reviewed and recommends to continue to not allow parking in that area along 4th Ave and on Church St from 3rd Ave to 4th Ave; however, with the hospital not active, feel it is appropriate to extend the alternate parking on Church Street, further west a block and allow alternate parking on Church St from 4th Ave to 5th Ave.

   We had a request to review parking on the north side of Linn Street between Center St & 3rd Avenue. With the number and widths of drives between Center St and 1st Avenue, it would leave little room for parking. In review of 1st Avenue to 3rd Avenue, city staff have no issue removing the current parking restriction. It is believed it may have had to do with the fire station previously being located there. Since there is a turn lane near 3rd Ave, we will stop parking at the alley.

   We had a request to review parking on Byron St from N 1st Ave to N 2nd Ave. There have been issues with a mix of vehicles parking in parallel, angle, and 90-degree parking on the south side. Rarely do we see vehicles parked on the north side. There is space for angle parking on the south side if we add the north side to no parking. We are recommending no parking on the north side. Once street division staff paint angle lines on the south side, the public can angle park. This will be in line with some parallel to angle conversion we did on 1st and 2nd Ave.

   These changes are shown within schedule:
   i. Schedule II (2): No Parking Any Time.

b. The city received a request to modify some of the permit required parking around the High School, specifically to add a stretch of 3rd Ave from where Bobcat Boulevard connects, north to Pine Street. This section requires a permit to park in this area and it can be a resident, owner, city school district staff, or employee parking permit issued by the City. This change is shown within schedule:
   i. Schedule IV (4): Community School District staff and employee parking

c. During discussions of downtown parking and allowing an exemption permit, it was discussed and recommended to add downtown streets to streets that can not be parked on when snow alerts are issues. Refer to the attached exhibit with the recommended streets highlighted that are proposed to be added.

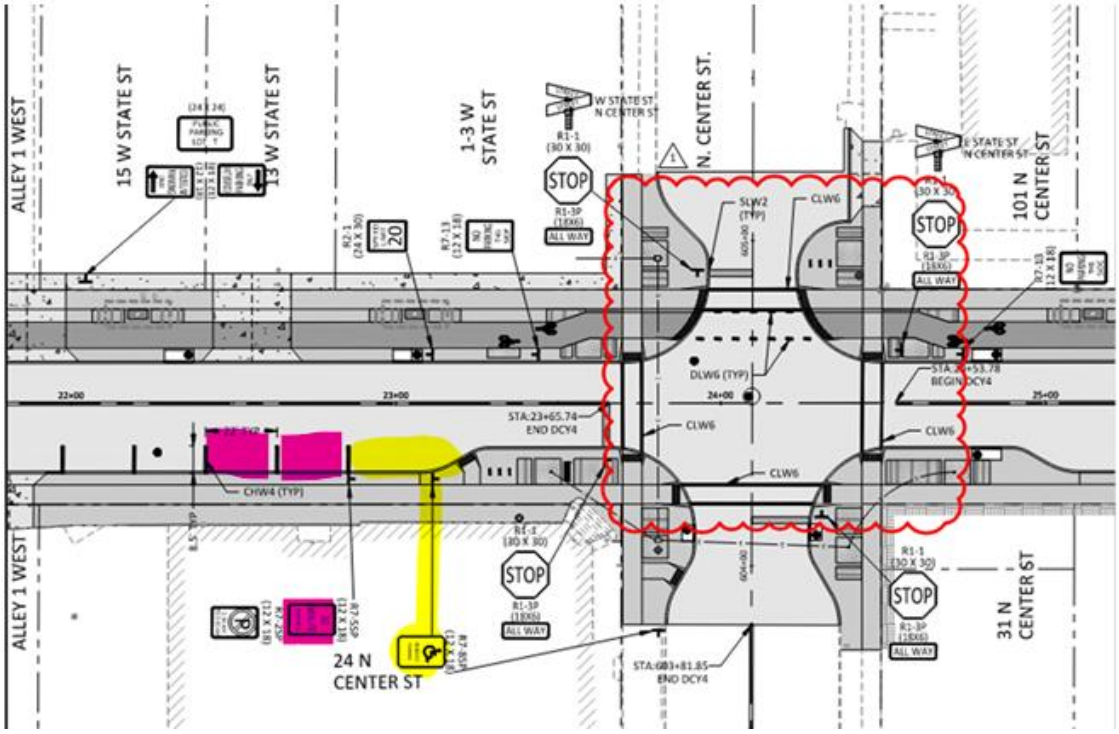
   While we updated the snow routes, we wanted to make the Ordinance (which had several higher traffic streets that weren't shown on the map due to no parking restructure) match the map. So, we added the listed streets in the Ordinance to the mark-up of the map. I also added Iowa Avenue and the new truck route around Edgewood St / N 8th Ave to be consistent with high traffic roads. I removed Marion Street from 3rd Ave to 8th Ave. Additionally, I added the connections near the police/fire station between W High Street, to 2nd St, to Anson St, to Center St.

These are shown within two schedules:

i. Schedule VII (7): Snow Removal; Parking Prohibited
ii. Schedule VIII (8): Snow Routes

d. Stall Time Restrictions, associated w/ or observed with State Street Reconstruction Project.

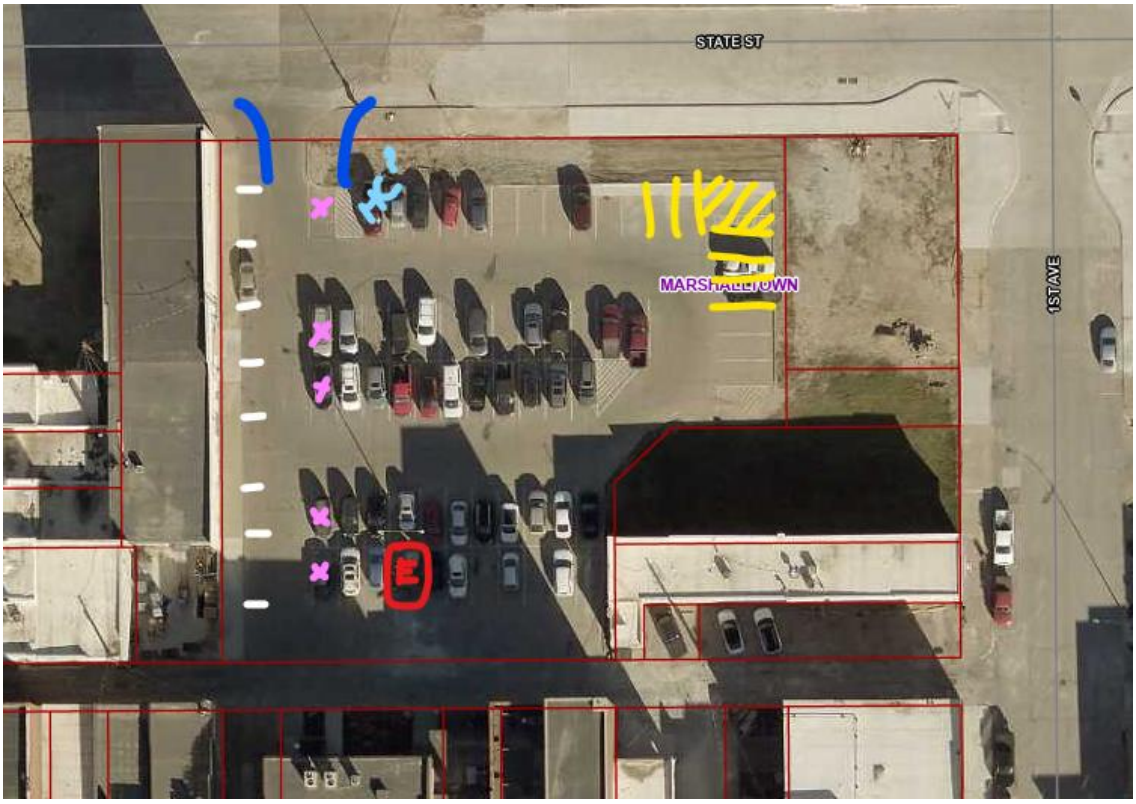
The parking along State Street, in front of the Carnegie / Park & Rec Building. Current Ordinance indicated the first four parking spaces west of N Center St should be 30-mintue stalls. However, previously we only had one stall signed – staff believe post tornado/derecho some signs disappeared and didn't get reinstalled. After discussion with city staff and review of the planned disabled stall as part of the State Street project, we propose the first stall be disabled (yellow), followed by two 30-minute stalls (magenta).



There was also noted a disabled stall in the 200 W State St, south side, 1t space west of 2nd St that was in the ordinance but is no longer there that is proposed to be removed from the Ordinance.

We also noted the three stalls in front of Marshalltown Water Works that were signed 30-minutes parking stalls were not in the Ordinance. We recommend adding them.

In conjunction with Parking Lot J, a parallel row of parking was established on the west edge of the parking lot (shown with white lines below). There have been comments/complaints of not having stalls available in the parking lot for customers because there were so many employees parked in the parking lot. We are proposing to make these stalls a 90-minute parking stall.



We currently only have a 30-mintue and 3-hour parking schedule. We proposed to add a table for a 90-minute, table (2) as well as renumber the 3-hour parking schedule to be table (3).

We also reviewed disabled parking for Parking Lot J and Parking Lot T in conjunction with the State Street & Parking Lot improvements. We are proposing the number of stalls required by ADA regulations in each: 3 stalls in Parking Lot J and 3 stalls in Parking Lot T.

During review of the 3-hour parking schedule, we noticed the following language, which we are recommending be deleted in its entirety:

Municipal parking lots as follows, except for specific government vehicle spaces: Lot T, 15 W. State Street

These changes are shown within:

i. Schedule IX (9): Disabled Parking
ii. Schedule X (10): Public Access Parking

We proposed the following Ordinance Amendment Schedule:

1st Reading: October 28, 2024
2nd Reading: November 11, 2024
3rd Reading: November 25, 2024

From previous Discussion on 09/23/24, related to restricted parking downtown:
Council directed staff to look into a potential permit language for downtown on-street parking. There was a section that referred to an exception to the restricted parking but did not have sufficient details to issue/enforce. The following are potential points of clarification for an exemption permit related to Section D Restrictions:

Exemption.

a. An exemption parking permit may be requested for any individual residing in the Restricted Parking from 2:30 am to 5:30 am area without private parking or public parking access immediately adjoining or directly across an alley or street.
b. The exemption will allow for parking from 2:30 am to 5:30 am on 1st Street, 2nd Street, 1st Avenue, and 2nd Avenue.
c. Proof of residence is required to be issued a permit by the City Clerk.
d. The permit must be properly displayed on the bottom corner of the rear driver side windshield.
e. The exemption is not valid when the snow ordinance is in effect.

From 09/09/24:
Following comments from citizens, council desired to discuss parking restrictions. Parking restrictions are set by Ordinance in Chapter 77 (attached).

A concern was brought up regarding the restricted parking from 2:30 AM to 5:30 AM on many downtown streets. That portion of the code (Part D of Schedule VI) is shown as below in *blue*.

(D) *Restricted parking between the hours of 2:30 a.m. and 5:30 a.m.* It shall be unlawful to park or leave standing any automobile, motor driven or operated truck, tractor, tractor trailer, house trailer or other motor vehicle equipment not governmentally owned or operated or controlled at any time on any day between the hours of 2:30 a.m. and 5:30 a.m. on any street, avenue or other place described as follows:

Side	***On Street***	***From***	***To***
Both	1st Avenue	Church Street	State Street
Both	1st Street	Church Street	State Street
Both	2nd Avenue	Church Street	State Street
Both	2nd Street	Church Street	State Street
Both	Center Street	Church Street	State Street
Both	Church Street	2nd Street	3rd Avenue
Both	Main Street	2nd Street	3rd Avenue
Both	N. 13th Street	Fremont Street	Summit Street
Both	State Street	2nd Street	3rd Avenue
All alleys bounded by Church Street, State Street, 2nd Street, 3rd Avenue			
Parking Lot C (Coliseum)			
Parking Lot L (Library)			
Parking Lot T (City Hall/ Carnegie)			
Parking Lot Z (Farmer's Market)			

Points of consideration for discussion:

1. What do other communities do?
    a. Ames – Parking meters; no parking 4 AM - 6 AM.
    b. Mason City – 2-hr limit; no parking 3 AM – 6 AM.
    c. Ottumwa – 2-hour limit; posted snow route.
    d. Fort Dodge – 2-hour limit; fee-based parking permits for overnight.

2. Why no parking time period?
    a. Prohibit overnight street parking (refer to discussion from Dec 23 / Jan 24)
    b. Provide time for maintenance activities such as sweeping, pothole patching, curb repair, pavement marking, and snow removal.

For reference snow route / restrictions map attached, Main St is not on a route.

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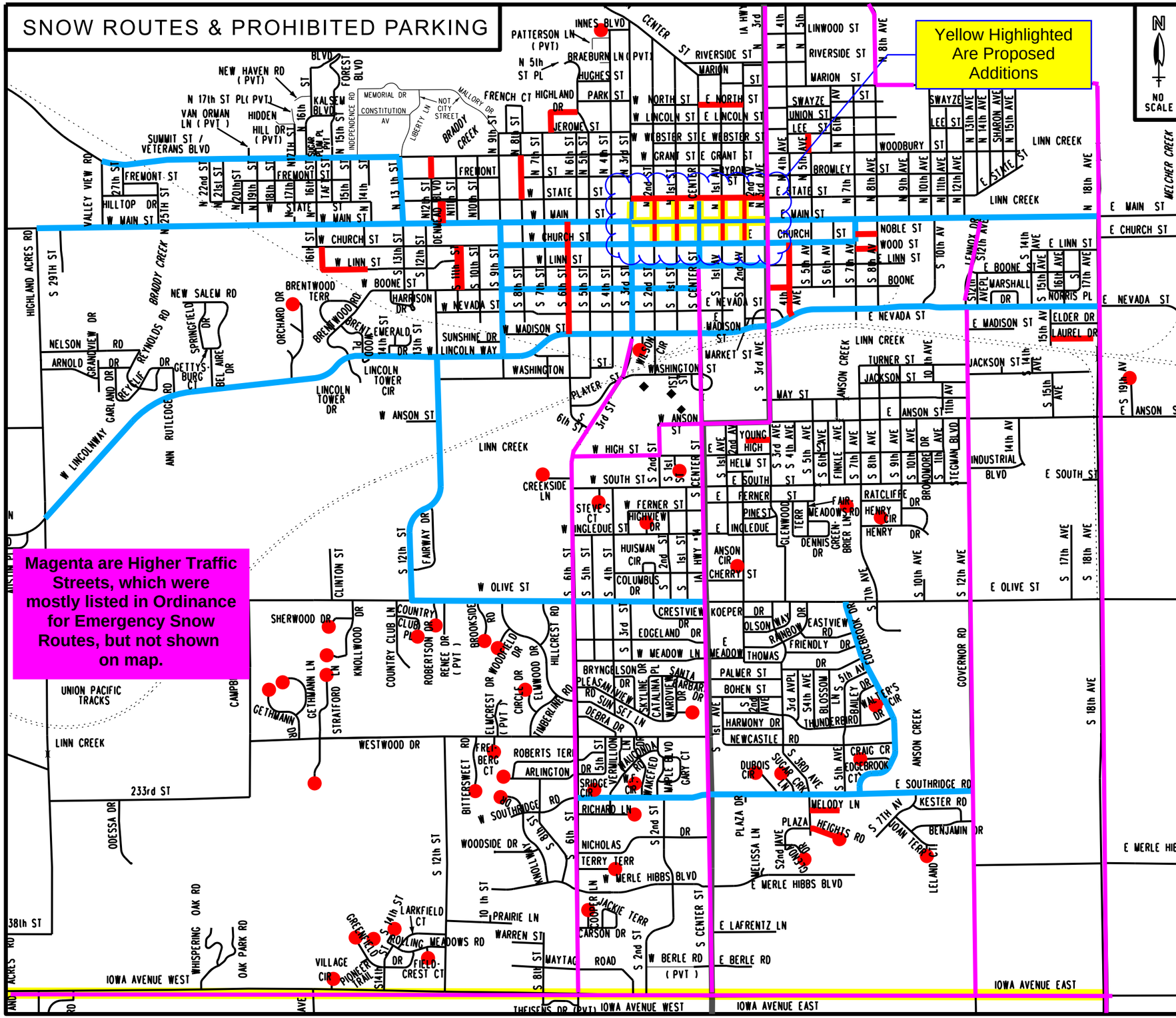
SNOW ROUTES & PROHIBITED PARKING



Emergency Snow Routes

Street	From	To
South 7th Avenue	East Main Street	East Church Street
South 9th Street	West Lincolnway	West Main Street
North 13th Street	West Main Street	Summit Street
West Boone Street	South 9th Street	South Center Street
West/East Church Street	South 9th Street	South 7th Avenue
Edgebrook Drive	East Southridge Road	East Olive Street
West/East Linn Street	South 3rd Street	South 3rd Avenue
West Lincoln Way	Highland Acres Road	South 9th Street
Madison Street	South 9th Street	South 4th Avenue
East Nevada Street	South 4th Avenue	South 18th Avenue
West Main Street	Highland Acres Road	North 3rd Street
East Main Street	North 3rd Avenue	North 18th Avenue
West Olive Street	South 12th Street	South Center Street
South 12th Street	West Lincoln Way	West Olive Street
South 3rd Street	West Main Street	Madison Street
West/East Southridge Road	South 6th Street	Governor Road
Summit Street	Valley View Road	North 13th Street

Snow Removal Parking Prohibited

Side	On Street	From	To
All Cul-De-Sac's/Circles			
East	South 4th Avenue	Church Street	Nevada Street
Both	North 5th Avenue	Woodbury Street	Lee Street
Both	South 6th Street	Main Street	Madison Street
Both	North 6th Street	Highland Drive	Jerome Street
Both	North 8th Street	Summit Street	State Street
Both	South 11th Street	West Church Street	West Boone Street
Both	North 12th Street	Fremont Street	Summit Street
Both	South 16th Street	Church Street	Linn Street
Both	East Boone Street	3rd Avenue	4th Avenue
Both	Denmead Boulevard	West Main Street	West State Street
Both	Highland Drive	5th Street	6th Street
Both	Laurel Drive	South 15th Avenue	East to dead end
Both	West Linn Street	16th Street	A point 861 feet east
Both	Melody Lane	South 3rd Avenue	West to the dead end
Both	Noble Street	South 7th Avenue	South 8th Avenue
Both	East North Street	North Center Street	North 2nd Avenue
Both	Plaza Heights Road	South 3rd Avenue	Iowa River Hospice
South	East/West State Street	North 3rd Street	North 3rd Avenue
Both	Walter's Circle	Edgebrook Drive	Cul-de-Sac
Both	Wood Street	South 7th Avenue	South 8th Avenue
Both	Young Street	South 3rd Ave	West to the North/South Alley

Cul-de-Sacs

1	Innes Blvd	16	Sherwood Drive	31	Sugar Creek Lane
2	Orchard Drive	17	Country Club Place	32	Craig Circle
3	Wilson Circle	18	Robertson Drive	33	Richard Lane
4	S 1st Street	19	Brookside Road	34	Cooper Lane
5	Steve's Court	20	Woodfield Drive	35	Terry Terrace
6	Highview Drive	21	Circle Drive	36	Glenda Drive
7	Anson Circle	22	Pleasantview Road	37	Plaza Heights Road
8	Henry Circle	23	Walter's Circle	38	Leland Court
9	Ratcliffe Drive	24	Bittersweet Road	39	Village Circle
10	S 19th Avenue	25	Freiberg Court	40	Greenfield Drive
11	Gethmann Drive	26	Arlington Drive	41	Rolling Meadows Road
12	Gethmann Lane	27	Knollway Drive	42	S 14th Street
13	Stratford Lane (North)	28	Southridge Court	43	Fieldcrest Court
14	Stratford Lane (South)	29	Wakefield Circle	44	Creekside Lane
15	Knollwood Drive	30	Dubois Circle		

ORDINANCE 15095

AN ORDINANCE TO AMEND TABLE 156.B.004-1 AND SECTION 156.J.005-1(D)(1) OF THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA

WHEREAS, the City Council of the City of Marshalltown, Iowa, has adopted Table 156.B.004-1 concerning Residential District Lot and Building Standards and the City Staff has identified various provisions of Table 156.B.004-1 that require amendment; and

WHEREAS, the City Council of the City of Marshalltown, Iowa, has adopted Section 156.J.005.1(D)(1) requiring Planning and Zoning Commission review of proposed special use permits and the City Staff has identified an unnecessary public hearing requirement with respect to Planning and Zoning Commission review of proposed special use permits, as provided in Section 156.J.005.1(D)(1); and

WHEREAS, the City Council finds the following amendments to Chapter 156 Zoning to be in the best interest of the City and the public in general.

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

Section 1. Amendment to Table 156.B.004-1. Table 156.B.004-1 is hereby superseded and replaced, in its entirely, as provided in "Exhibit A," attached hereto and incorporated herein by this reference:

Section 2. Amendment to Section 156.J.005-1(D)(1).

> (1) *Review and decision*. The Zoning Administrator shall review the proposed special use permit and give a report to the Plan and Zoning Commission. The PZC shall ~~hold a public hearing and~~ make a recommendation to the BOA, ~~who~~ which shall subsequently conduct a public hearing before ~~making~~ taking final action to approve, approve with conditions, or deny the proposed special use permit.

Section 3. Repealer. All ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed.

Section 4. Severability Clause. If any section, provision, or part of this ordinance shall be adjudged invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole or any section, provision or part thereof not adjudged invalid or unconstitutional.

Section 5. When Effective. This ordinance shall be in full force and effect after its final passage, approval and publication as provided by law.

Passed this _____ day of _____ 2024 and signed this _____ day of _____ 2024.

CITY OF MARSHALLTOWN, IOWA

_____

Joel Greer, Mayor

ATTEST:

_____

Alicia Hunter, City Clerk

I, Alicia Hunter, City Clerk of the City of Marshalltown, Iowa, do hereby certify that the foregoing ORDINANCE was passed and approved by the City Council of the City of Marshalltown, Iowa, on the _____ day of _____ 2024, and was published in the Marshalltown Times-Republican, a newspaper of general circulation in the City of Marshalltown, Iowa, on the _____ day of _____ 2024.

_____

Alicia Hunter, City Clerk

EXHIBIT A

Table 156.B.004-1
Residential District Lot and Building Standards
(See Figures 156.B.004-1 through -6, below)

Housing/Building Type[1]	Maximum Gross Density (Units/ Acre)	Common Civic or Open Space/ Landscape Surface Area Ratio[2]	Minimum Lot[3]		Maximum Building Height	Minimum/Maximum Setbacks			
			Area	Width		Front	Side Street	Side [4]	Rear
Graphic Legend			A	B	C	D	E	F	G
AG - Agricultural Residential Conventional Development Type									
Single-Family Detached5	0.04	N/A	25 Acres	120	35 ft.	50 ft.	20 ft.	15 ft.	50 ft.
Permitted Nonresidential Uses[7]	N/A	N/A	25 Acres	120	35 ft.	50 ft.	20 ft.	15 ft.	50 ft.
RR - Rural Residential Conventional Development Type									
Single-Family Detached	2.82	N/A	14,375 s.f.	85 ft.	35 ft.	35 ft.	10 ft.	8 ft.	35 ft.
Permitted Nonresidential Uses[7]	N/A	N/A	14,375 s.f.	85 ft.	35 ft.	35 ft.	10 ft.	8 ft.	35 ft.
RL - Low Density Residential Conventional Development Type									
Single-Family Detached	4.40	N/A	9,000 s.f.	75 ft.	35 ft.	30 ft.	8 ft.	7 ft.	35 ft.
Single-Family Attached	4.90	N/A	8,000 s.f.	60 ft.	35 ft.	30 ft.	8 ft.	7 ft.	35 ft.
Duplex	5.64	N/A	7,000 s.f.	60 ft.	35 ft.	30 ft.	8 ft.	8 ft.	35 ft.
Permitted Nonresidential Uses[7]	N/A	N/A	9,000 s.f.	75 ft.	35 ft.	30 ft.	15 ft.	10 ft.	35 ft.
RL - Low Density Residential Cluster Development Type									
Single-Family Detached	5.58	15%	6,500 s.f.	60 ft.	35 ft.	15 ft.	7 ft.	7 ft.	25 ft.
Single-Family Attached	5.64	15%	6,000 s.f.	50 ft.	35 ft.	15 ft.	7 ft.	7 ft.	20 ft.
Duplex	5.98	20%	5,250 s.f.	50 ft.	35 ft.	20 ft.	8 ft.	8 ft.	20 ft.
Permitted Nonresidential Uses[7]	N/A	20%	6,500 s.f.	60 ft.	35 ft.	15 ft.	7 ft.	7 ft.	25 ft.
RM - Medium Residential Density Conventional Development Type									
Single-Family Detached	7.15	N/A	5,000 s.f.	60 ft.	35 ft.	30 ft.	10 ft.	5 ft.	25 ft.
Single-Family Attached	8.56	N/A	4,500 s.f.	50 ft.	35 ft.	20 ft.	10 ft.	5 ft.	25 ft.
Duplex	10.47	N/A	4,000 s.f.	50 ft.	35 ft.	20 ft.	8 ft.	5 ft.	20 ft.
Townhouse	11.44	N/A	3,500 s.f.	25 ft.	45 ft.	20 ft.	8 ft.	5 ft.	20 ft.
Multiplex	11.54	N/A	3,500 s.f.	75 ft.	45 ft.	20 ft.	8 ft.	5 ft.	20 ft.

EXHIBIT A

Apartment	18.513	N/A	2,000 s.f.	60 ft.	45 ft.6	10 ft.	5 ft.	5 ft.	25 ft.
Manufactured Home Park	Refer to § 156.C.005(D)(1), Manufactured Home Park								
Permitted Nonresidential Uses[7]	N/A	N/A	5,000 s.f.	75 ft.	35 ft.	20 ft.	10 ft.	10 ft.	25 ft.
RM - Medium Residential Density Infill Development Type									
Single-Family Detached	11.40	N/A	3,250 s.f.	40 ft.	35 ft.	20 ft.	5 ft.	5 ft.	20 ft.
Single-Family Attached	11.66	N/A	3,250 s.f.	40 ft.	35 ft.	20 ft.	5 ft.	5 ft.	20 ft.
Duplex	11.91	N/A	3,000 s.f.	30 ft.	35 ft.	10 ft.	5 ft.	5 ft.	20 ft.
Townhouse	11.44	N/A	3,500 s.f.	25 ft.	45 ft.	10 ft.	5 ft.	5 ft.	25 ft.
Multiplex	13.33	N/A	3,000 s.f.	75 ft.	45 ft.	10 ft.	5 ft.	5 ft.	25 ft.
Apartment	23.21	N/A	1,600 s.f.	60 ft.	45 ft.6	10 ft.	5 ft.	5 ft.	25 ft.
Manufactured Home Park	Refer to § 156.C.005(D)(1), Manufactured Home Park								
Permitted Nonresidential Uses[7]	N/A	N/A	5,000 s.f.	75 ft.	35 ft.	20 ft.	10 ft.	10 ft.	25 ft.
RM - Medium Residential Density Tiny House or Cottage Development Type									
Cottage Court	9.48	30%	2,000 s.f.	45 ft.	20 ft.	20 ft.	8 ft.	5 ft.	20 ft.
Tiny House	14.5	30%	1,000 s.f.	40 ft.	20 ft.	20 ft.	8 ft.	5 ft.	20 ft.
RH - High Density Residential Conventional Development Type									
Single-Family Detached	13.46	N/A	2,750 s.f.	40 ft.	35 ft.	20 ft.	5 ft.	5 ft.	20 ft.
Single-Family Attached	13.78	N/A	2,750 s.f.	40 ft.	35 ft.	20 ft.	5 ft.	5 ft.	20 ft.
Townhouse	18.18	N/A	2,000 s.f.	20 ft.	45 ft.	10 ft.	10 ft.	5 ft.	15 ft.
Multiplex	21.50	N/A	2,000 s.f.	45 ft.	45 ft.	10 ft.	10 ft.	10 ft.	25 ft.
Apartment	30.66	N/A	1,200 s.f.	60 ft.	45 ft.6	10 ft.	5 ft.	5 ft.	10 ft.
All Permitted Nonresidential Uses7	N/A	N/A	7,500 s.f.	50 ft.	40 ft.	10 ft.	10 ft.	10 ft.	25 ft.
RH - High Density Residential Infill Development Type									
Single-Family Detached	14.81	N/A	2,500 s.f.	40 ft.	35 ft.	20 ft.	5 ft.	5 ft.	20 ft.
Single-Family Attached	15.16	N/A	2,500 s.f.	40 ft.	35 ft.	20 ft.	5 ft.	5 ft.	20 ft.
Multiplex	21.39	N/A	1,875 s.f.	45 ft.	45 ft.	10 ft.	8 ft.	5 ft.	25 ft.
Townhouse	21.87	N/A	1,600 s.f.	18 ft.	45 ft.	5 ft.	5 ft.	5 ft.	15 ft.
Apartment	30.66	N/A	1,200 s.f.	60 ft.	45 ft.6	5 ft.	5 ft.	5 ft.	10 ft.
All Permitted Nonresidential Uses7	N/A	N/A	N/A	N/A	40 ft.	10 ft.	10 ft.	10 ft.	25 ft.
Notes:									

1. Refer to § 156.C.004, Limited Use Standards, and § 156.C.005, Special Use Standards, for additional standards that may apply to a given housing type.

EXHIBIT A

2. Minimum common civic or open space is calculated based on a percentage of the overall subdivision and applies to residential and mixed-use districts. Landscape surface area ratio is calculated based on a percentage of the lot and applies to nonresidential developments.
3. Minimum lot area is calculated on a "per dwelling unit" basis. Minimum lot width is calculated for the entire lot.
4. Zero feet is the side setback for the shared party wall between single-family attached units and between townhouse units.
5. Including a manufactured or modular home on its own lot (applies to all districts).
6. The maximum height of an apartment building may be increased by special use permit as set forth in § 156.C.005, Special Use Permit Standards.
7. Refer to Table 156.C.003-1 for list of uses.

MARSHALLTOWN
IOWA

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

TO: Mayor and City Council
FROM: Cindy Kendall
DATE: October 14, 2024
RE: Amendment for Chapter 156.B.004-1, the associated table and Chapter 156.J.005.1(D)(1) and its associated table

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: To clarify and expedite building and special use permits processes.

Recommendation: The Planning and Zoning Commission has reviewed the proposed changes, conducted a public hearing and is recommending passage of both the text and tables for Chapter 156 as presented in the Council packet

Budget Impact: Legal and publication expense

Description/Background: Chapter 156.B.004-1, Residential District Lot and Building Standards were reviewed and a public hearing was conducted concerning proposed changes to various side yard setbacks. These changes ensure that all permissible building types in each district were listed (some were missing) and that the side yards were appropriate for each district.

Chapter 156.J.005-1(D)(1) and the associated table listed a public hearing to be conducted by BOTH the Planning & Zoning Commission and Board Of Adjustment (BOA) for a special use permit. The state code requires the Public Hearing at the BOA level and the Planning and Zoning Commission felt there was no rationale to duplicate that step. In addition to the cost of the public hearing, the Commission felt the time delay to complete a special Use permit was unnecessarily drawn out. After a public hearing the Commission recommended approval by the Council.

Both of these amendments were vetted by legal staff before the public hearings were conducted.

The public hearing on this ordinance amendment is set for October 28th during the 2nd reading.

Economic Impact Analysis: October 2024 Preliminary Results

City of Marshalltown Brownfields Assessment Program

Purpose

The purpose of an Economic Impact Analysis (EIA) is to estimate the effects of a change in the economy as a result of a new program, business, project, or event. This EIA studies the economic impacts from an influx of institutional spending related to the redevelopment of brownfield properties, and, as a result, expenditures associated with redevelopment projects. Since the late 1990s, the Environmental Protection Agency (EPA) has provided communities with funding to identify potential hazards and prepare for remediation. This EIA estimates the total value of the City of Marshalltown's Brownfields Program through direct, indirect, and induced impacts associated with federal investments at the local level.

Funding History

In 2007, the City of Marshalltown (City) received a $200,000 EPA Brownfield Assessment Grant for petroleum and a $200,000 EPA Brownfield Assessment Grant for hazardous substances. The City also received a $300,000 EPA Brownfield Assessment Grant in 2021. Over the course of the three grants, approximately 72 properties were assessed through a variety of environmental investigations including Phase I Environmental Site Assessments (ESAs), Phase II ESAs, asbestos-containing materials (ACM) inspections, and lead-based paint (LBP) inspections. These activities accounted for roughly 67 percent of the total grant funding, or $466,000. Approximately 27 percent, or $189,000 of the total grant funding was allocated to planning activities, which included site cleanup plans, area-wide redevelopment planning, and completion of several Analysis of Brownfield Cleanup Alternatives (ABCA) reports. Finally, about $45,000, or 6 percent of the total grant funding, was utilized to support wages for City personnel.

Methodology

IMPLAN, an industry-leading economic impact modeling and analysis software, was utilized to estimate the economic impact of the City's brownfields assessment program. An Input-Output (I-O) Model was built in IMPLAN to quantitatively represent the economic impact (output) of local institutional spending (input). Grant activities completed between 2007-2013 were modeled separately than activities completed between 2021-2024 due to inflation and the purchasing power of a dollar. "Buckets" were utilized to group grant activities that generated different economic outcomes. For example, since the labor, fieldwork, and equipment associated with a Phase I ESA in comparison to a Phase II ESA are different, these expenses were modeled separately for greater accuracy. Similarly, money that was spent as a result of grant activities, or leveraged funding, was also modeled separately through buckets for private, federal government, and state and local government spending. Marshall County, Iowa, a micropolitan statistical area was selected as the region for this local-level analysis. Figure 1 illustrates how the City's various spending and leveraged monies were modeled in the IMPLAN software.

DRAFT

eocene.com
8951 Windsor Parkway
Johnston, IA 50131

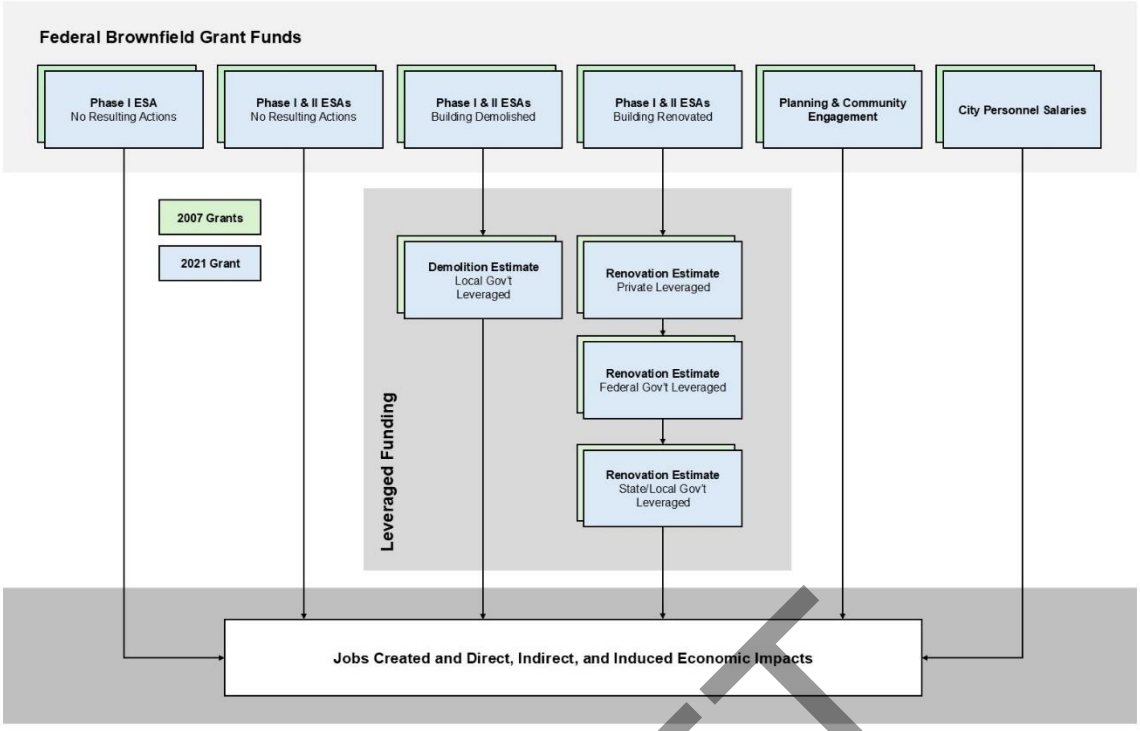


Figure 1. IMPLAN Input-Output Model Framework

Preliminary Results

The EPA's investment of $700,000 in grants awarded to the City has had a positive economic impact on the region. Based on publicly available data, an estimated $18,874,000 in private and other institutional dollars have been leveraged since 2007 for the redevelopment of properties that previously received assistance through the City's brownfields program. Two redevelopment projects, 134 East Main Street (Tallcorn Towers) and 210 East Main Street (Marshalltown Senior Residences), account for roughly 83 percent of leveraged monies. The total estimated economic impact of both grant funding and leveraged monies to the Marshall County micropolitan economy is shown below in Table 1.

Table 1. Estimated Economic Impacts

Level of Impact	Employment	Labor Income	Value Added	Output
Direct	132.73	$6,942,309.69	$9,686,001.51	$25,799,622.85
Indirect	44.42	$2,391,904.51	$4,449,287.13	$7,740,264.91
Induced	21.41	$950,426.01	$2,049,862.05	$3,547,989.98
Totals	**198.55**	**$10,284,640.21**	**$16,185,150.68**	**$37,087,877.74**

Total output represents all levels of impacts and is the sum of Labor Income, Value Added, and Intermediate Inputs, which are the goods and services required to produce activities associated with brownfields redevelopment. An estimated total of 199 jobs are supported by the $37.1 million of output from the City's brownfield program and leveraged redevelopment dollars. Preliminary results suggests that for every $100 invested in activities associated with brownfields redevelopment, an additional $89 of value is generated, the majority of which is captured by the local economy. Eocene Environmental Group, Inc. is currently fine-tuning the IO model and completing a more detailed analysis of economic impacts. Results stated in this preliminary summary should not be considered final until the entire EIA is published.

DRAFT

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

MARSHALLTOWN
IOWA

TO: Mayor and City Council
FROM: Heather Thomas, Public Works Director (*Assisting with Community Development*)
DATE: October 28, 2024
RE: Brownfield 2024 Annual Update

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:
Incentivize redevelopment of existing buildings
Invest in Downtown redevelopment
Reduce blight and promote safety in neighborhoods

Recommendation:
None – Annual updates on program are a requirement.

Budget Impact:
None.

Description/Background:
Annually, city staff are to prepare and present an update on the program to City Council. In 2019, the city began working towards a Brownfield Assessment Grant application. This was submitted in 2020 and award began in 2021 for $300,000. The grant program provides for a community-wide assessment grant related to environmental brownfields through the EPA.

The original grant project award was 09/01/21 – 08/30/24. The city applied for and received a 9-month extension for a new project end date of 05/31/25. We are currently awaiting a response from EPA on a budget amendment to move a portion of the awarded grant to other budget classifications as shown on the following table. In short, we are requesting about $16,000 be moved from direct city expense to contractual expenses that will directly be used for environmental assessments. This would put us at approximately $27,500 in available funds for additional assessment work remaining in the project.

	TOTAL				
Budget Class	**ORIGINAL BUDGET**	**JAN 2024 AMENDED BUDGET**	**CURRENT BUDGET AMENDMENT REQUEST**	**EXPENSES THRU 06/24**	**BALANCE (BASED ON CURRENT AMENDMENT REQUEST)**
Personnel	$11,690.00	$11,690.00	$3,571.92	$3,571.92	$0.00
Fringe Benefits	$3,310.00	$3,310.00	$1,054.10	$1,054.10	$0.00
Travel	$2,750.00	$2,750.00	$746.71	$746.71	$0.00
Equipment	$0.00	$0.00	$0.00	$0.00	$0.00
Supplies	$3,500.00	$3,500.00	$0.00	$0.00	$0.00
Contractual	$278,500.00	$278,500.00	$294,427.27	$229,841.76	$64,585.51
Other	$250.00	$250.00	$200.00	$200.00	$0.00
Total Direct	$300,000.00	$300,000.00	$300,000.00	$235,414.49	$64,585.51
Total Indirect	$0.00	$0.00	$0.00	$0.00	$0.00
Total Budget	**$300,000.00**	**$300,000.00**	**$300,000.00**	**$235,414.49**	**$64,585.51**

The following projects have been evaluated for eligibility and with assessments completed on some, as follows:

		Outputs			
Property Name/Address	**Eligibility Approval Date**	**Phase I – Final Date**	**QAPP Addenda Approval Date**	**Phase II Report – Draft & Final Date**	**Cleanup Planning – Draft & Final Date**
15 S. 1st Street	Not Eligible				
102-104 W Main Street	2/22/2022	6/30/2022	Emailed to EPA 7/29/22. EPA approved 10/6/22.	12/12/2022	Building has been removed.
110 W Main Street	2/22/2022	6/30/2022	Emailed to EPA 7/29/22. EPA approved 10/6/22.	12/12/2022	Building has been removed.
112 W Main Street	2/22/2022	6/30/2022	Emailed to EPA 7/29/22. EPA approved 10/6/22.	12/12/2022	Building has been removed.
114 W Main Street	2/22/2022	6/30/2022	Emailed to EPA 7/29/22. EPA approved 10/6/22.	12/12/2022	Building has been removed.
2 W Main Street	Not Eligible				
6-8 W Main Street	Not Eligible				

		Outputs			
Property Name/Address	**Eligibility Approval Date**	**Phase I – Final Date**	**QAPP Addenda Approval Date**	**Phase II Report – Draft & Final Date**	**Cleanup Planning – Draft & Final Date**
10 W Main Street	2/22/2022	Building Demolished.			
12 W Main Street	Not Eligible				
101 W Main Street	2/22/2022	5/31/2022	Emailed to EPA 7/19/22. Revised draft to EPA 9/9/22. EPA approved 10/6/22.	2/14/2023	Building has been removed.
132 E State Street	12/29/21 (DNR) 2/22/2022 (EPA)	Farmer's Market Vacant Lot - Property Seeded & Stabilized			
20 E Main Street	6/30/2022	8/30/2022	Emailed to EPA 9/26/22. EPA approved 1/11/23.	3/30/2023 5/9/2023	1/8/2024
21 W Main Street	6/30/2022	8/28/2022	Emailed to EPA 9/26/22. EPA approved 10/20/22.	7/26/2023 7/28/2023 8/14/2023	1/15/2024
23 W Main Street	12/20/2022	1/10/2023	Emailed to EPA 7/10/23. EPA approved 11/15/23.	1/4/2024	1/31/2024
105 Washington Street	Submitted 8/24/22 (EPA) 8/24/22 (DNR)	Property Owner Change			
107 Washington Street	Submitted 8/24/22 (EPA) 8/24/22 (DNR)				
201 Washington Street	Submitted 8/24/22 (EPA) 8/24/22 (DNR)				
211 W Main Street	4/5/2023 – City not proceeding				
Parcel 8418-26-379-011	4/5/2023 – City not proceeding				
5 N 3rd Street	4/5/2023 – City not proceeding				
312 E Main Street	City not proceeding	UPH (McFarland Property)			
308 E Main Street	Waiting on Access Agreement	UPH (McFarland Property)			
406 E Main Street	Waiting on Access Agreement	UPH (McFarland Property)			

		Outputs			
Property Name/Address	**Eligibility Approval Date**	**Phase I – Final Date**	**QAPP Addenda Approval Date**	**Phase II Report – Draft & Final Date**	**Cleanup Planning – Draft & Final Date**
408 E Main Street	Waiting on Access Agreement	UPH (McFarland Property)			
412 E Main Street	Waiting on Access Agreement	UPH (McFarland Property)			
8 N 5th Avenue	Waiting on Access Agreement	UPH (McFarland Property)			
306-308 E State Street	Waiting on Access Agreement	Property Sold to HCI			
312 E State Street	Waiting on Access Agreement	Property Sold to HCI			
106 N 4th Avenue	City not proceeding	Property Sold to HCI			
3 S 4th Avenue	Not Eligible	Old Hospital Site: Obtained Signed Access Agreement 10/24; DNR determined not eligible due to underground tank; We reached out to determine if EPA would grant partial eligibility for Asbestos Testing; waiting for EPA response			
413 E Main Street	Not Eligible				
Parcel 8418-35-226-007	Waiting on Access Agreement				
407 E Main Street	Not Eligible				
101 E Ferner Street	5/10/2023	6/20/23	City Demo'd Property		
506 E Boone Street	5/10/2023	6/22/23	City Demo'd Property, Sold and Combined		
506 N 2nd Street	5/10/2023	6/22/23	City Demo'd Property		
510 E Main Street	5/10/2023	6/28/23	City Demo'd Property		
702 Swayze Street	5/10/2023	6/29/23	City Demo'd Property		
207 Market Street	2/1/2024	2/28/24	Structure Determined Unsafe to Perform Phase 2		
128 ½ E Main Street	12/21/23	1/31/24	Emailed to EPA 11/14/23. EPA approved 2/29/24.	4/26/24 4/30/24	
501 N 1st Avenue	2/14/2024	3/13/24	Emailed to EPA 11/14/23. EPA approved 4/24/24.	6/5/2024	
2500 S Center Street	City not proceeding	Current Property Owner - Not Interested			
2502 S Center Street	City not proceeding	Current Property Owner - Not Interested			
2504 S Center Street	City not proceeding	Current Property Owner - Not Interested			

		Outputs			
Property Name/Address	**Eligibility Approval Date**	**Phase I – Final Date**	**QAPP Addenda Approval Date**	**Phase II Report – Draft & Final Date**	**Cleanup Planning – Draft & Final Date**
208 Leo Street	Submitted to City 8/23/24	City waiting on property owner for signed access agreement			
30 E Main Street	Submitted to City 9/17/24		Submitted to City 9/17/24	Property owner decided not to proceed.	

In addition to the above, I have had preliminary conversations with two other properties about potential interest in the program; however, I'm waiting on EPA review on eligibilities that we have submitted as we are coming to the end of the grant cycle. EPA has not been very responsive/timely. We do believe we have the projects to spend remaining funds within the grant cycle, provided we can get some responses from EPA.

As part of any project, it is good to evaluate effectiveness and return on investment. As part of this grant assessment, a portion of the contractual funds were allocated to Planning Activities. We are investing in an economic impact analysis (draft attached) that helps compile statistics about redevelopment of the properties that were able to utilize Brownfield Assessment program funds. When evaluating properties that participated in the 2007 assessment grant and current grant, this indicates that for the EPA's investment of $700,000, redevelopment has had a positive economic impact resulting in $18,874,000 in private and other institutional dollars leverage. Two properties (Tallcorn Towers and Marshalltown Senior Residences) account for 83% of that amount. It is also important to note that redevelopment is generally a slow process, so most of the leveraged fund properties were a result of the 2007 assessment grant and impact of our current grant is not yet realized.

Overall, we continue to feel this program is a good investment of city staff resources in aiding community development in Marshalltown and are in the process of applying for an additional assessment grant cycle.

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MARSHALLTOWN
IOWA

POLICY FOR THE SALE OF SURPLUS REAL PROPERTY

Adopted November 24, 2008
Amended April 11, 2011
Amended January 24, 2022
Amended May 22, 2023

Governing Law

The Code of Iowa prescribes rules and regulations for the disposal of real property by cities. The following code section is applicable to all sales of surplus real property by the City of Marshalltown.

364.7 Disposal of property.
A city may not dispose of an interest in real property by sale, lease for a term of more than three years, or gift, except in accordance with the following procedure:

1. The council shall set forth its proposal in a resolution and shall publish notice as provided in section 362.3, of the resolution and of a date, time, and place of a public hearing on the proposal.
2. After the public hearing, the council may make a final determination on the proposal by resolution.
3. A city may not dispose of real property by gift except to a governmental body for a public purpose.

Policy

The City of Marshalltown seeks to dispose of surplus City-owned real property utilizing a method that best fits the type of real property to be disposed of and which takes the following criteria into consideration:

- Equity
- Fair Market Value
- Highest and Best Use
- Taxable Value

The City shall only offer a Quit Claim Deed unless the history of the property is known and a Warranty Deed is determined to be appropriate under the circumstances and upon the advice of legal counsel.

Property Disposal Methods

The City of Marshalltown may utilize a number of disposal methods for the sale of surplus real property. Each method seeks to establish fair market value for the property.

- Sealed Bid
  A Request for Sealed Bids is typically used when there are multiple known or unknown potential purchasers for a property. A public notice is issued with details on the property and requesting all bids be turned in by a specific date and time. The highest compliant bid received is the bid that is recommended to the City Council for the sale of the property, provided the Council has the right to waive irregularities and/or to reject any or all bids.

- Live Auction or Online Auction
  A live auction or online auction is a format that works best with a higher value asset and in situations where multiple parties are interested in a property. The online option provides for a wider distribution/availability of bidders.

- Listing with Realtor
  Listing a property with a realtor and reviewing offers is a method that aligns with real property that includes a structure or when multiple parcels are offered for sale together or individually. This also results in an independent professional with relevant knowledge and experience marketing and bringing attention to the real property.

- Direct Sale
  A direct sale involves the City contracting directly with an individual or entity for the sale of surplus real property. This method is often utilized where the fair market value of property is known or easily ascertainable; or where the property due to its nature, size, or location is only marketable to a limited number of potential purchasers.

- Request for Proposal
  This process can only be used for real property in an urban renewal area where slum and blight exist. It allows the Council to seek proposals for how the property would be used to determine the best proposal considering more than just the amount to be paid. The specific procedure set forth in Iowa Code Chapter 403.8.

Procedure

The appropriate procedure for the sale of real property will be determined on a case-by-case basis taking into consideration the totality of facts and circumstances. In most cases, the sales method will be subject to City Council approval upon a staff recommendation. This policy shall not be construed to limit the City's ability to utilize any lawful method of disposal with respect to any particular parcel or parcels of real property.

Determining Fair Market Value

Except for gifts of real property to another governmental body for a public purpose, or when future taxable value is part of a transaction, the City may not make gifts of public property; meaning the City may not dispose of real property for less than its fair market value. Fair market value is generally defined to mean the price for which real property will sell between a willing buyer and seller when exposed to market conditions. The City may utilize multiple

methods for determining fair market value to avoid a conveyance of real property constituting a gift, such as:

- Determining land value by reference to adjacent land values;
- Hiring an appraiser to determine the value;
- Listing the property with a realtor who determines the value;
- Requesting bids on the property; or
- Reviewing at most six months of similar property sales as provided on Beacon to determine an average

Rights-of-Way

The City of Marshalltown frequently receives requests for the vacation and sale of rights-of-way (portions of streets or alleys) from adjacent property owners. These types of requests tend to be unique to the extent the property involved is of interest only to a limited number of adjacent property owners. The direct sale method most common.

After receiving a request in writing from an adjacent property owner or determining the right-of-way has been previously vacated but not sold, the following process will be utilized.

1. Contact all utilities to determine whether there are utilities in the area and if easements must be maintained. If a utility (including the City) requests the right-of-way not be vacated, the requesting party is notified and the transaction stops.

2. Determine a price for the right-of-way. If the right-of-way is a remnant from a prior vacation or has been previously vacated but not conveyed, the adjacent owner will be offered the right-of-way at $250 if less than 0.25 acres.

   If the right-of-way if larger than 0.25 acres or is not adjacent to a prior vacation, the adjacent land values shall be used to determine an average price. A reduction factor of 80% may be applied if the parcel is required to maintain easements for utilities, is unsuitable for building a structure, or other circumstances which reduce the value and use of the land.

3. Place the item as a discussion item on a Council agenda. The packet should include the original request including the amount the owner is offering to pay for the property and a staff memo with information on the square foot value and adjacent owner objections, if any.

Since the Council may not dispose of a vacated alley or right-of-way to the individual requesting the vacation by way of gift, the City must receive fair market value for the property.

If Council moves to proceed with the vacation of an alley or right-of-way, staff will facilitate proceedings compliant with Iowa Code 364.7 and bring the matter back to the Council for action.

Vacant Lots
The City regularly acquires or through demolition of dilapidated structures creates vacant lots which are owned and maintained by the City, typically as part of the City's Dangerous & Dilapidated Building program. The City Administrator maintains a list of these properties, which is updated as demolition projects are closed out. There are a number of sales methods that can be used dispose of a vacant lot, and the location and characteristics of the vacant lot will be the best determinant of the most appropriate sales method. Regardless of the sales method utilized, nothing shall preclude the City from obtaining an appraisal to help determine fair market value and/or to set a floor for pricing a property.

When the sale of a vacant lot is requested or is deemed suitable by staff, the City Administrator will place a discussion item on the agenda for the property or properties to be disposed of with a recommendation for an appropriate disposal method. The Council will then determine the best method for disposal and direct staff to proceed accordingly.

Facilities with Land
While less common, the City does have excess facilities to dispose of at times. The disposal method shall be at the election of the Council based upon the type of asset and relevant facts and circumstances.

When a facility is ready to sell, the City Administrator will place a discussion item on the agenda with the property or properties to be disposed of with a recommendation for the disposal method. The Council will then determine the best method for disposal and direct staff to proceed accordingly.

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

MARSHALLTOWN
IOWA

TO: Mayor & City Council
FROM: Alicia Hunter, City Clerk
DATE: October 23, 2024
RE: City lot at 817-819 N 5th Ave

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:

Recommendation:

Budget Impact:

Description/Background:

The City of Marshalltown has a vacant lot at 817-819 N 5th Avenue. At the March 11, 2024, staff requested direction on the disposal of the lot and were directed to use the sealed bid process. This was again confirmed on 7/8/24 after legal review of proceedings. Below is the full history of council action on this lot. After multiple bidding cycles with either no bids or with unsuccessful awards, staff feel there is a substantive change in this measure and request new direction on the disposal of this lot.

3/11/24 Minutes:
Alicia Hunter, City Clerk, advised the city lots that were designated for the in-fill housing grant are no longer needed since the funding was withdrawn as the grant does not allow the city to act as the developer and we were unable to find a private developer to complete the project. Motion by Ladehoff, second by Nichols to dispose of the lots by sealed bid processes. Motion carried 6-1, Kell dissenting.

A Request for Sealed Bids was put out on 5/7/24 with bids due 5/31/24. The City received 4 bids on the lot. The high bidder withdrew their bid. A resolution was brought forward to set a public hearing on the conveyance and transfer to the next high bid for 6/24/24.

6/24/24 Minutes:
Mayor Pro-tem Ladehoff opened a public hearing at 6:45 pm for PROVIDING FOR THE CONVEYANCE AND TRANSFER OF TITLE FOR 817-819 NORTH 5TH AVENUE FROM THE CITY OF MARSHALLTOWN, IOWA TO CATHERINE GOODING. No written or public comments were received. The public hearing was closed at 6:45 pm. Motion by Thompson, second by Mitchell to adopt RESOLUTION 2024-148 PROVIDING FOR THE CONVEYANCE AND TRANSFER OF TITLE FOR 817-819 NORTH 5TH AVENUE FROM THE CITY OF

MARSHALLTOWN, IOWA TO CATHERINE GOODING. Motion failed 1-5, Kell, Ladehoff, Mitchell, Nichols, and Schneider dissenting.

Staff brought forward a discussion item at the 7/8/24 meeting noting legal counsel advised the 6/24 action is a rejection of all bids and we must put back out for bid.

7/8/24 Minutes:
Alicia Hunter, City Clerk presented discussion on the sealed bid process for 817-819 N 5th Avenue. Motion by Thompson, second by Ladehoff to rebid 817-819 N 5th Avenue with the same process. Motion carried 6-0.

A Request for Sealed Bids was put out on 7/15/24 with bids due 8/7/24. The City did not receive any bids.

A Request for Sealed Bids was put out on 8/9/24 with bids due 9/4/24. The City did not receive any bids.

A Request for Sealed Bids was put out on 9/11/24 with bids due 10/9/24. The City received 2 bids on the lot. A resolution was brought forward to set a public hearing on the conveyance and transfer to the high bid for 10/28/24.

10/14/24 Minutes:
Motion by Schneider, second by Mitchell to adopt RESOLUTION 2024-212 SETTING A PUBLIC HEARING FOR THE CONVEYANCE AND TRANSFER OF TITLE OF CITY OWNED VACANT LOT. Alicia Hunter, City Clerk advised the high bid was $16.36. Motion failed 3-3, Fonseca, Kell, and Ladehoff dissenting; Thompson abstaining.